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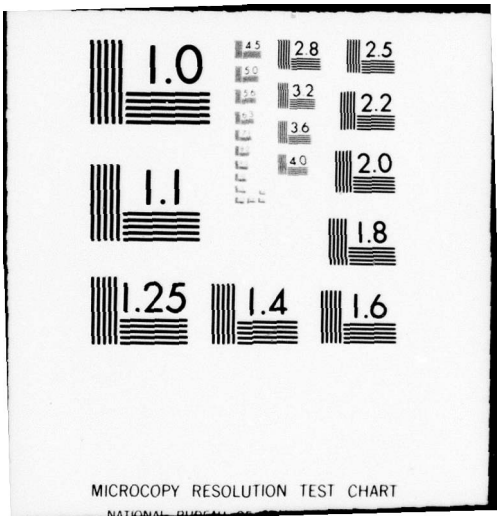
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REPORT NO. FAA-RD-79-2



# SRDS

# TECHNICAL PROGRAM DOCUMENT

LEVEL II

## FISCAL YEAR 1979

## RESEARCH & DEVELOPMENT APPROVED PROJECTS





JANUARY 1979



**U.S. DEPARTMENT OF TRANSPORTATION**
**FEDERAL AVIATION ADMINISTRATION**
**Systems Research & Development Service**
**Washington, D.C. 20590**

TECHNICAL PROGRAM DIRECTIVE

NO. 1/ 2/ 3/ 79-01-01-21

SUBJECT: FY-79 SRDS Annual Technical Program

The enclosed FY-79 SRDS Annual Technical Program Document (TDP) establishes the projects approved for implementation by the Director of SRDS. The implementation of these efforts is subject to the availability of resources.

This Annual Technical Program will be under continuing review and will be updated by means of Technical Program Directives as technical and other requirements dictate. Resumes in this Technical Program Document are structured according to the FAA Engineering and Development Programs 01 through 21.

DAVID J. SHEFTEL
Director, Systems Research and
Development Service, ARD-1

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1/ Fiscal Year

2/ Sequence of Technical Program Directive Issuance, coded and controlled by ARD-50/54.

3/ FAA ED Programs (per FAA-ED-00-C as amended).

**Technical Report Documentation Page**

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| FAA-RD-79-2 | | |

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| SRDS TECHNICAL PROGRAM DOCUMENT, Fiscal Year 1979, Research and Development Approved Projects. | January 1979 |
| | 6. Performing Organization Code: SRDS |

| 7. Author(s) | 8. Performing Organization Report No. |
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| | 11. Contract or Grant No.: ARD-50 |
| | 13. Type of Report and Period Covered: Technical Program Document FY-79 |
| 12. Sponsoring Agency Name and Address<br>U.S. DEPARTMENT OF TRANSPORTATION<br>Federal Aviation Administration<br>Systems Research and Development Service<br>Washington, D.C. 20590 | 14. Sponsoring Agency Code |

15. Supplementary Notes

12 234 pi

This document

16. Abstract

This Technical Program Document (TPD) contains Research and Technology Resumes which reflect Systems Research and Development Service, Federal Aviation Administration, approved projects. These resumes highlight the requirement, technical objective, approach, milestones scheduled for accomplishment, and end item products.

The TPD is structured according to the following 21 Engineering and Development Programs: (topics include:)

01 System *
02 Radar,
03 Beacon,
04 Navigation,
05 Airborne Separation Assurance,
06 Communications,
07 Approach and Landing Systems,
08 Airport/Airside
09 Airport/Landside *
10 Oceanic **
11 ATC Systems Command Center Automation,
12 Enroute Control,
13 Flight Service Stations,
14 Terminal/Tower Control,
15 Weather, and
16 Technology *
17 Satellites *
18 Aircraft Safety,
19 Aviation Medicine **
20 Environment
21 Support

*Transferred to OSEM
** Not included

| 17. Key Words | 18. Distribution Statement |
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## FOREWORD

This FY-79 Technical Program Document (TPD) contains Research and Technology Resumes which reflect Systems Research and Development Service, Federal Aviation Administration, approved projects. These resumes highlight the requirement, technical objective, approach, milestones scheduled for accomplishment, and end-item products.

The TPD is structured according to the following 21 Engineering and Development Programs:

| | | | |
|---|---|---|---|
| 01 | System * | 11 | ATC Systems Command Center Automation |
| 02 | Radar | 12 | Enroute Control |
| 03 | Beacon | 13 | Flight Service Stations |
| 04 | Navigation | 14 | Terminal/Tower Control |
| 05 | Airborne Separation Assurance | 15 | Weather |
| 06 | Communications | 16 | Technology * |
| 07 | Approach and Landing Systems | 17 | Satellites * |
| 08 | Airport/Airside | 18 | Aircraft Safety |
| 09 | Airport/Landside * | 19 | Aviation Medicine ** |
| 10 | Oceanic ** | 20 | Environment |
| | | 21 | Support |

The fourth Arabic number in the Current Number/Code in block 2 of the Resume identifies the responsible lead division/staff in SRDS, i.e.,

| | | | |
|---|---|---|---|
| 1 | = | ARD-100 | Air Traffic Control Systems Division |
| 2 | = | ARD-200 | Communications Division |
| 3 | = | ARD-300 | Navigation Division |
| 4 | = | ARD-400 | Airport Division |
| 5 | = | ARD-500 | Aircraft and Noise Abatement Division |
| 6 | = | ARD-60 | Spectrum Analysis Staff |
| 7 | = | ARD-700 | Microwave Landing System Division |

Comments and recommendations concerning this TPD may be directed to the Chief, Program Management Staff, ARD-50.

* Transferred to OSEM
** Not included

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| Program/Subprogram | Title |
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| Program/Subprogram | | Title |
|---|---|---|
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| Program/Subprogram | | Title |
|---|---|---|
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| IV | 202-552-01 | Operational Noise Reduction |
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# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 021-241-01

3. REVISION:

4. START DATE: Continuing

5. TITLE OF PROJECT: Radar Sustaining Engineering

6. MANAGER/ORGANIZATION: Kenneth Coonley - ARD-243

7. REQUIREMENT: 9550 AAT-100-33

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-120 NPD 02-106
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide engineering and development support to insure an acceptable performance level of Airport Surveillance Radar and Air Route Surveillance Radar systems.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Various sustaining engineering tasks will be performed, as required, with NAFEC and Contractor support.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Packages, are INTENDED TO SUPPORT In-service radar improvement AND WILL BE DELIVERABLE TO AAF/AAT.

ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Monitor system | as req. |
| 2. Data Collection | as req. |
| 3. Recommendations forwarded | as req. |
| 4. Functional Specs | as req. |

14. FOOTNOTES: Milestones will vary, depending on type of engineering effort required to accomplish task.

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 022-242-01

3. REVISION:

4. START DATE: 10/1/76

5. TITLE OF PROJECT: Hazardous Weather Detection

6. MANAGER/ORGANIZATION: Kenneth Coonley - ARD-243

7. REQUIREMENT: ADA-1, AED-1, ARD-1/2 direction 6/25/76

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-120 NPD 02-106
   b. TSC:
   c. OTHER: IAA-DOT-FA-TQ-WAI-679 USAF, MIT Lincoln Laboratory

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: improve detection and display of hazardous weather with ATC radars.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: with contractor and NAFEC support, SRDS will provide for analysis, experiment, and development of techniques to measure storm turbulence and reflectivity. The techniques investigated will include advanced MTD processing, formatting and contouring of weather displays, and use of FAA and/or NWS derived pulse dopplar weather information.

12. PRODUCT:

THE PRODUCT(S) OF THIS RESUME, TDEs and/or Reports, are INTENDED TO SUPPORT hazardous weather display mods AND WILL BE DELIVERABLE TO AAF and/or AAT.

ON OR ABOUT FY-81/82.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. TDP issued for ASR Hazardous Weather Detection system | 10/81 |
| 2. TDP issued on ARSR MTD Weather System | 1/81 |
| 3. TDP issued for implementation of EnRoute Weather Reflectivity Contouring | 1/82 |
| 4. TDP issued for implementation of Doppler Weather Data on EnRoute PVD | 4/82 |
| 5. Report issued on Doppler Weather data applications | 3/81 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 022-243-01

3. REVISION:

4. START DATE: FY-73

5. TITLE OF PROJECT: Moving Target Detector (MTD)

6. MANAGER/ORGANIZATION: Kenneth Coonley - ARD-243

7. REQUIREMENT: Program Plan FAA-ED-02-1 and AAF ltr. 7/76

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-120 NPD 02-106
b. TSC:
c. OTHER: IAA-DOT-FA-TQ-WA1-679, USAF, MIT/LL

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Improve detection of aircraft in the presence of ground and precipitation clutter and improve radar tracking capability for the automated sytem in both Terminal and EnRoute.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contractor and NAFEC support, will provide for the development and evaluation of a Moving Target Detector, which is an advanced radar signal processor.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT FY-80 Procurement buy AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 4/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. MTD-II tec data package to AAF | 10/78 |
| 2. Terminal MTD-II post-proc. retrofit to field unit | 11/78 |
| 3. Post-processor modification TDP to AAF | 3/79 |

14. FOOTNOTES:

I 022-243-01

RD FORM 79-1 TEST 9/15/78


# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 031-241-01

3. REVISION:

4. START DATE: Continuing

5. TITLE OF PROJECT: ATCRBS Sustaining Engineering

6. MANAGER/ORGANIZATION: Martin Natchipolsky ARD-241

7. REQUIREMENT: AAF-1 Letter dtd. 8/10/77

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-120 NPD #03-173
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Sustain acceptable level of ATCRBS performance and maintain cognizance of the operational beacon environment, both ground and air.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: With support of NAFEC, Regions and contractors, SRDS will conduct appropriate measurement exercises and instrumentation.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Tech Data Pkgs. and/or Reports, IS/ARE INTENDED TO SUPPORT in-service sustaining engineering assistance AND WILL BE DELIVERABLE TO requesting organizations as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Field Site Problem Investigation | as req. |
| 2. Respond to Request for R,D&E Effort | as req. |
| 3. Report on T&D of Transponders and Digitizers | TBD* |
| 4. Collect Transponder Performance Data 1978, 1979 | 3/80 |

14. FOOTNOTES:

*TBD - To be determined

I-031-241-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 032-241-01

3. REVISION:

4. START DATE: FY-78

5. TITLE OF PROJECT:
ATCRBS Interference Analysis

6. MANAGER/ORGANIZATION:
Martin Natchipolsky ARD-241

7. REQUIREMENT:
FAA-ED-03-2 A (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-120 NPD #03-173

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Determine existing and potential future beacon system interference, and recommend means to avoid, eliminate or minimize such interferences.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: With NAFEC, Region and contractor support, SRDS will conduct necessary measurements, studies and analyses to make such determination/recommendation.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Tech Data Pkg/Report, IS INTENDED TO SUPPORT maintenance of beacon interference at minimum level AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT Jan. 1981.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete environment measurements | 9/79 |
| 2. Issue data report on environment | 3/80 |
| 3. Issue report on analysis, study on Interference Reduction/Avoidance | 1/81 |

14. FOOTNOTES: Products of effort will permit SRDS to initiate required corrective actions through modifications and improvements to the beacon systems.



RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 033-241-01

3. REVISION:

4. START DATE: 7/1/73

5. TITLE OF PROJECT:
Antenna Performance & Processor Improvement for Enhanced Beacon Surveillance and Communication

6. MANAGER/ORGANIZATION:
Martin Natchipolsky, ARD-241

7. REQUIREMENT: FAA-ED-03-2 A (draft 9550 # AAF-75-04

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-180 NPD #03-173

c. OTHER: Lincoln Lab.
I.A.A. DOT-FA71-WAI-242

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support production procurement and deployment of improved ATCRBS antennas & processors.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contractor support, will fabricate, evaluate and demonstrate beacon antenna and processor improvements for enhancing beacon surveillance performance. Test data, evaluation reports and appropriate specification data will be prepared and delivered.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Tech. Data Pkg./Reports, IS INTENDED TO SUPPORT improved ATCRBS antennas & processors AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Reflector Separate Rotator T&E Report (9550 end item) | 2/79 |
| 2. TDP Handoff, Lightweight Array | 4/80 |
| 3. Engineering Report on Beacon Surface Performance* | 7/80 |

14. FOOTNOTES:

*Additional milestones will be determined upon completion of this study.

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 034-241-01

3. REVISION:

4. START DATE: 1/72

5. TITLE OF PROJECT:
Discrete Address Beacon System (DABS)

6. MANAGER/ORGANIZATION:
P. D. Hodgkins, ARD-240

7. REQUIREMENT:
FAA EDPP-03-1 (6/27/78)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-120
NPD # 03-108 NPD #03-197

c. OTHER: USAF (Lincoln Laboratory) 2WAI-261
ECAC TI 76WA-3772 MITRE 78WA-4075

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Establish surveillance and data link communications requirements for UG3RD, and develop a national standard.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: With contractor support, SRDS will procure and test DABS ground and airborne equipment for both single and multi-site DABS.

12. PRODUCT:

THE PRODUCT(S) OF THIS RESUME, National Standard and Technical Data Packages, are/~~is~~ INTENDED TO SUPPORT Surveillance and Data Link Communications Requirements of ATARS and UG3RD AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 4/80 and 4/82.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Final National Standard | 4/80 |
| 2. TDP for single-site DABS | 4/80 |
| 3. TDP for milti-site DABS | 4/82 |

14. FOOTNOTES:

I 034-241-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 034-242-01

3. REVISION:

4. START DATE: 1/1/72

5. TITLE OF PROJECT:
Automatic Traffic Advisory and Resolution Service (ATARS)

6. MANAGER/ORGANIZATION:
John A. Scardina, ARD-200

7. REQUIREMENT:
Draft FAA-ED-03-3 (3/79)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-120 NPD #03-108
ANA-220 NPD #05-298

b. TSC:

c. OTHER: Lincoln Lab #2WA1-261
MITRE #FA78WA-4075

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop new safety assurance service to provide for evolutionary implementation, at lower user costs, of an automatic ground-based traffic advisory service and resolution service for all aircraft.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS with NAFEC and contractor support, will procure DABS Engineering Model, and modify ATARS software to reflect improvement. Engineering tests and field trials will be conducted.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Packages, ~~IS~~ XX are INTENDED TO SUPPORT UG3RD Separation Assurance Reqmts. AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 4/80 and 4/82.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Begin evaluation of improved resolution algorithm | 1/79 |
| 2. Handoff of TDP for advisory service | 4/80 |
| 3. Handoff TDP for resolution service | 4/82 |

14. FOOTNOTES:

04 NAVIGATION

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 041-305-04

3. REVISION:

4. START DATE: 1/78

5. TITLE OF PROJECT:
Wilcox 585B VOR Systems Parameters

6. MANAGER/ORGANIZATION:
F. Bassett, ARD-331

7. REQUIREMENT:
9550 #AAF-410-78-03

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-330 NPD #04-309

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine magnitude of ground check error component due to slot antenna, the counterpoise, goniometer and VOR transmitter system.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: NAFEC will install and test a Wilcox 585B VOR.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Letter Report, IS INTENDED TO SUPPORT Field Problems AND WILL BE DELIVERABLE TO AAF-410.

ON OR ABOUT 8/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete installation | 12/78 |
| 2. Complete testing | 3/79 |
| 3. Complete Letter Report | 8/79 |

14. FOOTNOTES:

II 041-305-04

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 041-305-05

3. REVISION:

4. START DATE: 8/73

5. TITLE OF PROJECT:
Develop VOR Zero Phase Standard

6. MANAGER/ORGANIZATION:
Frank Bassett, ARD-331

7. REQUIREMENT:
9550 #AFS-700-74-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-330 NPD #04-309

c. OTHER:
NBS FA76WAI-640

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop AF & RF standards for VOR Zero Phase.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: National Bureau of Standards will develop a VOR zero phase standard with joint DOD/FAA funding.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, VOR Zero Phase Standard, IS INTENDED TO SUPPORT VOR System Accuracy AND WILL BE DELIVERABLE TO AFS.

ON OR ABOUT 6/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete Audio portion | 4/81 |
| 2. Handoff Audio Standard | 6/81 |
| 3. Complete RF portion | 8/82 |
| 4. Handoff RF Standard | 10/82 |

14. FOOTNOTES:

II 041-305-05

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 041-305-06

3. REVISION:

4. START DATE: 6/73

5. TITLE OF PROJECT: Propogation Model

6. MANAGER/ORGANIZATION: Frank Bassett, ARD-331

7. REQUIREMENT: ED Program Plan ED-04-01 A(draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-330 NPD #04-309
   b. TSC:
   c. OTHER: Syracuse University FA 73 WA-3272

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop computer program which will access specific effects of various types of reflectors around a VOR or Dopplar VOR.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Under contract, computer program will be developed. NAFEC will verify the computer predictions.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Computer Program, IS INTENDED TO SUPPORT power line problems in the field AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 3/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. NAFEC Testing | 11/79 |
| 2. Final Report | 1/80 |
| 3. Handoff Computer Programs | 3/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 041-305-09

3. REVISION:

4. START DATE: 6/76

5. TITLE OF PROJECT: VOR Siting Criteria Update

6. MANAGER/ORGANIZATION: Frank Bassett, ARD-331

7. REQUIREMENT: ED Program Plan ED-04-01A(draft

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: incorporate new developments such as double sideband Doppler VOR, stacked arrays, and propagation modelling into the VOR siting criteria handbook.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS personnel will perform this task utilizing outputs from other projects.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Updated Siting Criteria, IS INTENDED TO SUPPORT 2nd generation implementation AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 10/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Propagation Modelling input | 1/80 |
| 2. Complete update | 10/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 041-307-01

3. REVISION:

4. START DATE: 10/77

5. TITLE OF PROJECT:
Develop Remote Maintenance Monitor System for Salmon, Idaho

6. MANAGER/ORGANIZATION:
A. Simolunus, ARD-330

7. REQUIREMENT:
AAF-1 letter, May 26, 1977

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-300

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a remote maintenance monitor system for the mountain top VORTAC site at Salmon, Idaho for shipment of certification data to the FSS at Idaho Falls.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: development of software required to perform certification of the VORTAC facility and the shipment of information from the Salmon site to the FSS at Idaho Falls. This will be accomplished through the use of a microprocessor and the moniter and 8-pt. ground check unit developed by Edo-Aire Corp. under FAA contract.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Remote Maintenance Monitor System, IS INTENDED TO SUPPORT Project at Salmon, Idaho AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 10/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Modify RMMS at Salmon, Idaho | 10/78 |

14. FOOTNOTES:

II 041-307-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 041-307-04

3. REVISION:

4. START DATE: 2/74

5. TITLE OF PROJECT: 2nd Generation VOR

6. MANAGER/ORGANIZATION: Frank Bassett, ARD-310

7. REQUIREMENT: ED-04-01AED Program Plan (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-330 NPD 04-309

b. TSC:

c. OTHER: EDO-AIRE FA74 WA-3617

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a NAFEC test bed for a Remote Maintenance Monitor System (RMMS).

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: the test bed has been developed and installed at NAFEC by EDO-AIRE. NAFEC will test and evaluate the test bed in order to derive the production specification data.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Production Specification Data, IS INTENDED TO SUPPORT 2nd Generation VORTAC Procurement AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 3/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Interim NAFEC ltr Report Basic RMMS Evaluation | 2/79 |
| 2. Interim NAFEC ltr Report Diagnostic and Trend Analysis | 8/79 |
| 3. Final Report | 3/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 042-306-01

3. REVISION:

4. START DATE: 8/77

5. TITLE OF PROJECT: DME Traffic Loading

6. MANAGER/ORGANIZATION: Frank Bassett, ARD-310

7. REQUIREMENT: 9550 #AAF-410-77-08

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: obtain current data to establish the present level of traffic loading to extrapolate future requirements.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Testing will be conducted by SRDS only at facilities which show heaviest loading.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Letter Report, IS INTENDED TO SUPPORT DME Traffic Loading AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 10/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Letter Report | 10/78 |

14. FOOTNOTES:

II 042-306-01

FD FORM 79-1 TEST 9/15/78

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 042-308-01

3. REVISION:

4. START DATE: 7/76

5. TITLE OF PROJECT: U. S. National Standard for VORTAC System

6. MANAGER/ORGANIZATION: Art Simolunas, ARD-310

7. REQUIREMENT: ARD-1 letter dated 7/8/76

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: update standard for VORTAC System; definte standards and performance characteristics needed to support changes in use of the system and the radio frequencies employed.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will review system requirements. As needed, an FAA Ad Hoc group will study alternatives and participate in development of a revised standard. Coordination will be in accordance with established requirements.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, revised standard, IS INTENDED TO SUPPORT updated definitions of system standards AND WILL BE DELIVERABLE TO AOA-1.

ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| *1. Issue F.R. Notice on proposed revisions | 7/79 |
| 2. Complete review and response on comments | 10/79 |
| 3. Issue F.R. - Advisory Circular Notices re adoption of revised National Aviation Standard | 12/79 |

14. FOOTNOTES: *Schedule is subject to timely and successful completion of all support and coordination efforts.



RD FORM 79-1 TEST 9/15/78

RD FORM 79-1 TEST 9/15/78

## Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 043-304-01

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT: Evaluate VLF Noise Cancellation Antenna Concept

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: FAA-ED-04-01 A (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: Systems Control Inc. FA75 WA-3662

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: reduce the adverse effects of precipitation-caused noise on reception of VLF/Omega signals in aircraft.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Under Contract, tests will be made on an experimental noise cancellation antenna installed in a NOAA aircraft.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, evaluation report, IS INTENDED TO SUPPORT increased use of OMEGA/VLF navigation AND WILL BE DELIVERABLE TO SRDS by General Aviation ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Report | 12/78 |

14. FOOTNOTES:

II 043-304-01

RD FORM 79-1 TEST 9/15/78

14. FOOTNOTES: Products of effort will permit SRDS to initiate required corrective actions through modifications and improvements to the beacon systems.

I 032-241-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II043-304-03

3. REVISION:

4. START DATE: 6/72

5. TITLE OF PROJECT: Differential Omega Concept Evaluation

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: FAA-ED-04-01 A (Draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-330 NPD #04-302
b. TSC:
c. OTHER: FA 75 WA-3662 Systems Control, Inc.

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine the operational utility of differential Omega for Alaska.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Under contract and in cooperation with Transport Canada, SRDS will install and evaluate an operational type system in the Alaska/Yukon area.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Implementation Plan, IS INTENDED TO SUPPORT FAA Management decisions in applications of differential Omega AND WILL BE DELIVERABLE TO SRDS. ON OR ABOUT 4/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Feasibility evaluation report (NAFEC | 11/78 |
| 2. Evaluation report, Alaska/Yukon system | 12/79 |
| 3. Complete implementation plan (SRDS) | 4/80 |

14. FOOTNOTES:

II 043-304-03

RD FORM 79-1 TEST 9/15/78

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Additional milestones will be determined upon completion of this study.

I 033-241-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 043-304-04

3. REVISION:

4. START DATE: 11/76

5. TITLE OF PROJECT: Low Cost VLF/Omega Airborne Systems Evaluations

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: FAA-ED-04-01 A (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: Systems Control, Inc. FA75 WA-3662

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: evaluate available, low cost airborne VLF/Omega navigation systems to determine suitability for use by general aviation. Results will serve as guidance to FAA in approving/disapproving use of systems in ATC system as supplement to the VOR/DME system.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Three Low Cost (less than $10k) airborne Omega or VLF receivers will be procured for flight evaluation by contractor.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation Report, IS INTENDED TO SUPPORT FAA decisions on suitability of Low Cost VLF/Omega units in the NAS AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 10/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contractor work funded | 10/78 |
| 2. Final report - contractor evaluation | 10/79 |

14. FOOTNOTES:

II 043-304-04

RD FORM 79-1 TEST 9/15/78

RD FORM 79-1 TEST 9/15/78

## Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 043-304-05

3. REVISION:

4. START DATE: 11/76

5. TITLE OF PROJECT: Omega/VLF Signal Monitor System

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: AFS Letter 10/23/76
FAA-ED-04-01A Program Plan (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-330
NPD 04-362
b. TSC:
c. OTHER: Naval Ocean Systems Center
FA77 WAI-735

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop and evaluate a prototype OMEGA/VLF signal monitor system for use by the FAA in provision of advisories to pilots and ATC personnel.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, under an Inter-Agency agreement, will assemble off-the-shelf components with appropriate software into a prototype monitor system. It will be evaluated at NAFEC.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Specification, IS INTENDED TO SUPPORT OMEGA/VLF signal monitor requirements AND WILL BE DELIVERABLE TO AAF in support of oceanic and offshore navigation.
ON OR ABOUT 1/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Report-monitor system evaluation | 6/79 |
| 2. Hardware (one unit) to AAF | 1/80 |
| 3. Specification to AAF | 1/80 |

14. FOOTNOTES:

II 043-304-05

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 043-304-07

3. REVISION:

4. START DATE: 11/75

5. TITLE OF PROJECT: Evaluate Omega as a VOR/DME Supplement

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: FAA-ED-04-01A Program Plan (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-330 NPD #04-362
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine whether OMEGA navigation system is a useful supplement for VOR/DME in areas not served by that system.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will conduct flight tests with Omega equipment in offshore and mountainous areas, and in Alaska.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation Reports, IS INTENDED TO SUPPORT FAA decisions or use of OMEGA as VOR/DME supplement AND WILL BE DELIVERABLE TO _____. ON OR ABOUT 8/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Report, OMEGA Evaluations Offshore | 3/79 |
| 2. Report, OMEGA Evaluation in Mountainous areas | 3/79 |
| 3. SRDS Assessment of OMEGA as a VOR/DME Supplement | 8/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 043-304-09

3. REVISION:

4. START DATE: 9/78

5. TITLE OF PROJECT:
General Aviation OMEGA Receiver Development

6. MANAGER/ORGANIZATION:
George Quinn, ARD-732

7. REQUIREMENT:
FAA-ED-04-01A Program Plan (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop an OMEGA receiver suitable for use by general aviation in terms of performance, cost and ease of operation.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will develop a low cost receiver suitable for General Aviation in offshore and remote areas of the U.S., Alaska, and on oceanic routes. Performance will be required that might lead to approval for use in IFR Conditions. Evaluation will be by simulation and flight tests.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation Report, IS INTENDED TO SUPPORT use of OMEGA Navigation by General Aviation AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 6/82.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contract award | 9/79 |
| 2. Equipment delivery | 1/81 |
| 3. Evaluation Report | 6/82 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 043-311-02

3. REVISION:

4. START DATE: 4/74

5. TITLE OF PROJECT:
Civil OMEGA/VLF Airborne System

6. MANAGER/ORGANIZATION:
George Quinn, ARD-732

7. REQUIREMENT: Program Plan FAA-ED-04-01 A (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: Systems Control, Inc. FA75 WA-3662

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine feasibility of one airborne navigation system serving all phases of domestic and oceanic enroute flight, and domestic terminal area flight.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Under contract, a unit with best VLF and Omega techniques, validated by preceeding evaluations, will be assembled. Appropriate lab and flight tests will be conducted and results evaluated.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation Report, IS INTENDED TO SUPPORT FAA decisions on systems using combin-ations of VLF and OMEGA techniques AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT ~~10/79~~.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Initiate contractor effort | 10/78 |
| 2. Report, Civil OMEGA/VLF Airborne System | 10/79 |

14. FOOTNOTES:

II 043-311-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 043-311-03

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT: INS/VLF Combined System Evaluation

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: IA with USAF

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: U.S. Air Force FA75WAI-521 "Project Speckled Trout"

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine the technical performance of a combined INS/VLF system.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Under an InterAgency agreement with USAF and contract support, information from an LTN-51 INS and an ONTRAC III VLF/OMEGA set in an optimum fashion, will be combined in the LTN-51 computer. Individual and combined performance will be analyzed. Flight tests on the "Speckled Trout" aircraft will be conducted.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation Report, IS INTENDED TO SUPPORT FAA decisions on use of combined INS/VLF systems in domestic and oceanic airspace. AND WILL BE DELIVERABLE TO SRDS. ON OR ABOUT 10/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Evaluation report, INS/VLF system (Litton) | 10/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 043-311-5

3. REVISION:

4. START DATE: 6/78

5. TITLE OF PROJECT:
Evaluate OMEGA as a Primary Oceanic Navigation Aid

6. MANAGER/ORGANIZATION:
George Quinn, ARD-732

7. REQUIREMENT:
AFS-1 Letter dated 11/23/76

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-330 NPD #04-362

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine the suitability of OMEGA as a primary, or sole means, of aircraft navigation on oceanic routes.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Contracts will be awarded to each of three airlines to collect data from OMEGA systems already installed in aircraft as replacements for Loran-A. a contract will be awarded for analysis of data collected. Recording instrumentation will be provided by NAFEC.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation report, IS INTENDED TO SUPPORT FAA decision on use of OMEGA AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 4/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Data collection completed | 9/79 |
| 2. Evaluation report | 12/79 |
| 3. Final report | 4/81 |

14. FOOTNOTES:

II 043-311-5

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 043-311-07

3. REVISION:

4. START DATE: 1/78

5. TITLE OF PROJECT: OMEGA/VLF Dynamic Signal Simulator

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: FAA-ED-04-01A Program Plan (Draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop an OMEGA/VLF dynamic signal simulator for use by FAA in determining suitability of OMEGA/VLF airborne systems as navigation aids in the oceanic and domestic ATC.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will initiate a contract to develop a prototype dynamic OMEGA and VLF signal simulator. This prototype will be tested and evaluated by NAFEC, leading to system specifications for production procurement.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation Report, IS INTENDED TO SUPPORT use of OMEGA/VLF systems as sole means of navigation AND WILL BE DELIVERABLE TO SRDS.
ON OR ABOUT 7/82.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contract award | 9/79 |
| 2. System specification to AAF | 1/82 |
| 3. Evaluation report | 7/82 |

14. FOOTNOTES:

II 043-311-07

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 044-326-05

3. REVISION:

4. START DATE: 7/73

5. TITLE OF PROJECT:
RNAV Avionics Standards 2D/3D

6. MANAGER/ORGANIZATION:
Paul M. Rich, ARD-333

7. REQUIREMENT: (Draft)
ED Program Plan 04 (Navigation)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-260 NPD #04-276
ANA-310 NPD #07-384

c. OTHER: Systems Control, Inc.
FA72WA-3098

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: formulate a technical standard order for 2D/3D RNAV avionics.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Under contract, SRDS will develop data by means of operational and experimental flight tests and cockpit simulation. From this data, functional and operational performance standards will be established and coordinated with industry.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Standards, , IS INTENDED TO SUPPORT 2D/3D RNAV Avionics AND WILL BE DELIVERABLE TO AAT, AFS & Industry .

ON OR ABOUT 12/78 .

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Industry coordinated 2D/3D Standards | 12/78 |

14. FOOTNOTES:

II 044-326-05

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 045-390-01

3. REVISION:

4. START DATE: 6/78

5. TITLE OF PROJECT: Helicopter IFR Operation Evaluation

6. MANAGER/ORGANIZATION: James Nelson, ARD-706

7. REQUIREMENT: Helicopter Operations Development Program Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-310 NPD 04-350
   b. TSC:
   c. OTHER: NAVY - Interagency Agreement DOT-FA79-WAI-019

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support enhanced Instrument Flight Rule operations.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contractor, NAFEC and U.S. Coast Guard support, will collect flight data to provide information for standards concerning Loran-C, airborne radar approaches, and approaches using existing navigation aids. Flight experience and data will be collected from commercial operators along the Northeast Corridor during actual operation. Flight data will be collected and studies performed to provide basis for improved instrument procedures for the terminal area. Work will continue on icing and certification standards.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Concepts, Procedures, & Technical Data, IS INTENDED TO SUPPORT enhanced Helicopter IFR operations AND WILL BE DELIVERABLE TO AFS and AAT.

ON OR ABOUT 1983.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Interim ARA, Loran C, Omega Technical reports | 3/79 |
| 2. Review of lighting configurations for helicopters | 6/79 |
| 3. Assemble hardware and field test | 1/80 |

14. FOOTNOTES:

II 045-390-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 047-309-03

3. REVISION:

4. START DATE: 3/76

5. TITLE OF PROJECT: Remote Area Precision Positioning Systems (RAPPS)

6. MANAGER/ORGANIZATION: Frank Bassett, ARD-310

7. REQUIREMENT: ED-04-01A Program Plan (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-330 NPD #04-309
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop and evaluate a remote area precision positioning and data collection system to be used for non-precision approaches using Loran-C.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Under contract, the RAPPS will be developed and delivered to NAFEC for test and evaluation. Statistical data collection will permit evaluation of total system performance.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Letter Report, IS INTENDED TO SUPPORT RAPPS AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 10/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contract award | 10/78 |
| 2. Final Report | 12/79 |
| 3. NAFEC Testing | 6/80 |
| 4. Letter Report | 10/80 |

14. FOOTNOTES:

II 047-309-03

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 048-312-02

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT: Evaluate Loran-C as a VOR-DME Replacement

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: FAA-ED-04-01A Program Plan (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-330 NPD #04-362
   b. TSC:
   c. OTHER: FA75WA-3662 Systems Control, Inc.

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine if Loran-C is an acceptable replacement for the domestic VOR-DME system.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Necessary studies and tests will be conducted to examine technical capabilities and cost considerations in the potential use of Loran-C as a replacement for VOR-DME.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Assessment Report, IS INTENDED TO SUPPORT Loran-C as VOR-DME Replacement AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 6/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | | DATE |
|---|---|---|
| 1. | Report: Loran-C Signal Data Analysis | 2/79 |
| 2. | Report: Low Cost Receiver Eval. (NAFEC) | 8/80 |
| 3. | Report: Assessment, Loran-C as VOR-DME Replacement | 6/81 |

14. FOOTNOTES:

II 048-312-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 048-312-03

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT: Evaluate Loran-C as VOR-DME Supplement

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: FAA-ED-04-A Program Plan (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-330 NPD #04-362
   b. TSC:
   c. OTHER: FA75WA-3662-Systems Control, Inc.

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine if Loran-C is a useful supplement for VOR-DME in areas not served by VOR-DME (i.e. offshore, mountains and Alaska.)

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: NAFEC will conduct tests with available Loran-C receivers in Alaska, in mountainous areas, and offshore to determine technical performance in these areas.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation Report, IS INTENDED TO SUPPORT ~~FAA decisions on use of Loran-C as~~ VOR-DME supplement AND WILL BE DELIVERABLE TO _____. ON OR ABOUT 7/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Report - evaluation of TDL-424 receivers (NAFEC) | 7/79 |

14. FOOTNOTES:

II 048-312-03

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 048-312-04

3. REVISION:

4. START DATE: 1/76

5. TITLE OF PROJECT: Loran-C Signal Monitor System

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: FAA-ED-04-01 A Program Plan (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-330 NPD #04-362
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Assemble a Loran-C signal monitor system to advise FAA and users of the condition of Loran-C signals.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Available hardware will be integrated by contractor into a monitor system that will automatically advise Loran-C signal availability and conditions.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation Report, IS INTENDED TO SUPPORT FAA approved use of Loran-C AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 12/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contract award | 8/79 |
| 2. Evaluation report (NAFEC) | 12/81 |

14. FOOTNOTES:

II 048-312-04

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 048-312-05

3. REVISION:

4. START DATE: 9/78

5. TITLE OF PROJECT: Normalized Loran-C System

6. MANAGER/ORGANIZATION: George Quinn, ARD-732

7. REQUIREMENT: FAA-ED-04-01 A (Draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop and evaluate a Loran-C normalization system to facilitate use of that system as a non-precision approach aid.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Based on data collection and analysis that indicates need for real-time normalization of Loran-C signals used for airport approach guidance, a system will be developed to evaluate the technique.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation Report, IS INTENDED TO SUPPORT Use of Loran-C as a non-precision approach aid. AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 3/82.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contract award | 8/79 |
| 2. Equipment delivery | 8/80 |
| 3. Final Report | 3/82 |

14. FOOTNOTES:

II 048-312-05

05 AIRBORNE SEPARATION ASSURANCE

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 051-241-02

3. REVISION:

4. START DATE: 10/77

5. TITLE OF PROJECT: Infrared Runway Collision Avoidance System

6. MANAGER/ORGANIZATION: Ernest Lucier, ARD-253

7. REQUIREMENT: AFS-1 Request

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: BDM Corp. FA 78 WA-4196

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: investigate feasibility and effectiveness of developing a runway collision avoidance device using state-of-the-art infrared technology.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contractor support, will perform a system analysis to determine the utility of a two-color infrared runway collision avoidance system.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Report, IS INTENDED TO SUPPORT Investigation of Effective Runway Collision Avoidance Systems AND WILL BE DELIVERABLE TO FAA ON OR ABOUT 3/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Report | 3/79 |

14. FOOTNOTES:

I 051-241-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 052-241-01

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT:
Develop BCAS System

6. MANAGER/ORGANIZATION:
Owen E. McIntire, ARD-250

7. REQUIREMENT: EXCOM Meeting Minutes E7 (1975)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
NPP - #05-172 NPD #05-298

b. TSC:
PPA - #FAA-839

c. OTHER: ECAC - 70WAI-175
Lincoln Lab. 77WAI-817
MITRE

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a Beacon Collision Avoidance System (BCAS) that provides protection in airspace among all aircraft equipped with ATCRBS and DABS transponders with altitude encoders.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC, TSC, and contractor support, will conduct simulation tests, perform analyses, and develop hardware, for evaluation.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, BCAS U.S. National Standard, IS INTENDED TO SUPPORT Implementation of BCAS AND WILL BE DELIVERABLE TO Aviation Users.

ON OR ABOUT 10/83.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Full BCAS (3) Engineering Models delivered | 10/81 |
| 2. Full BCAS (up to 20) Prototype Models delivered | 12/82 |
| 3. BCAS U. S. National Standard | 10/83 |

14. FOOTNOTES: —

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 061-221-01

3. REVISION:

4. START DATE: FY-77

5. TITLE OF PROJECT: Communications Planning and Design

6. MANAGER/ORGANIZATION: Leo V. Gumina, ARD-206

7. REQUIREMENT: ADA-1 ltr dated 9/11/74

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
c. OTHER: AMAF Industries 78WAI-830
MITRE 78-WA-4075
b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide design data system description and maintenance for FAA's National Communication system for ATC system operations and environments projected for the 1980s.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contractor support, will provide planning, overall system design and analysis to support all A/G (RCS) Ground/Ground (VCS) and Data (DCS) Communications.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports, Design Data & System Description, IS INTENDED TO SUPPORT FAA Communication system design for ATC system. AND WILL BE DELIVERABLE TO FAA ON OR ABOUT as developed.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Common Usage Trunk Study | 12/78 |
| 2. Pilot Radio Circuit Database Development | 1/79 |
| 3. Tech. Support (Long Range) Contract Award | 1/79 |

14. FOOTNOTES:

I 061-221-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 061-222-01

3. REVISION:

4. START DATE: Continuing

5. TITLE OF PROJECT: FAA Communications Standardization

6. MANAGER/ORGANIZATION: D. Rhoades, ARD-222

7. REQUIREMENT: NCS letter to AAT-360

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: assist in the development and design of Federal and international communication standards and procedures, and determine impact to the FAA in the utilization of developed standards.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contractor support, will participate on Federal, national and international standards groups; and will insure FAA's communications requirements are known and considered in formulating new and revised standards.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports and Standards, IS INTENDED TO SUPPORT new and on-going telecommunications programs AND WILL BE DELIVERABLE TO FAA ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Heading Format Structure (code independent) (drafted) | 7/79 |
| 2. Terminal to Network Interface Standards for Packet Switched Networks operating in the Vertual Circuit Mode (drafted) | 3/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 061-223-01

3. REVISION:

4. START DATE: FY-78

5. TITLE OF PROJECT: Data Link Experiments

6. MANAGER/ORGANIZATION: John J. Bisaga, ARD-230

7. REQUIREMENT: ATAC Report, December 1969

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC: PPA #FAA-862
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: evaluate and demonstrate the benefits of using a data link for transmitting air-ground-air aviation related messages.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contractor support, will perform exploratory research and development to select applications, design ground and airborne terminals for input/output, and demonstrate a practical automatic data link.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report and design data, IS INTENDED TO SUPPORT _____ AND WILL BE DELIVERABLE TO FAA.

ON OR ABOUT as developed.

13. MILESTONE SCHEDULE:

| | DESCRIPTION | DATE |
|---|---|---|
| 1. | Demonstration at DABSEF | 12/78 |
| 2. | Final Report/Documentation | 4/80 |

14. FOOTNOTES:

I 061-223-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 062-221-02

3. REVISION:

4. START DATE: FY-78

5. TITLE OF PROJECT: Voice Switching Control System (VSCS)

6. MANAGER/ORGANIZATION: Leo Gumina, ARD-206

7. REQUIREMENT: FAA-ED-06-1 (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide support to AAF for the procurement of signalling and control equipment and radio and interphone/intercom systems at centers and towers/TRACONS.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will design, develop, and test the equipment. The program is in two phases: Phase I - design studies and Phase II - hardware development.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Packages, are, IS INTENDED TO SUPPORT procurement of signal/control equipment AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 2/82 and 7/83.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. VSCS Contract award | 8/80 |
| 2. S/C Tech. Data Pkg. | 2/82 |
| 3. VSCS Tech. Data Pkg. | 7/83 |

14. FOOTNOTES:

I 062-221-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 062-221-03

3. REVISION:

4. START DATE: 12/77

5. TITLE OF PROJECT: Develop VHF/UHF A/G Communications Antennas

6. MANAGER/ORGANIZATION: L. Bosin, ARD-223

7. REQUIREMENT: 9550 #AAF-440-77-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: Harry Diamond Labs 78WAI-851

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support new generation of VHF and UHF Air/Ground Communications Antennas.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contractor support, will provide conceptual engineering design fabrication and test services; operational antenna models and associated hardware description, specification and evaluation documentation.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Tech. Data Package, IS INTENDED TO SUPPORT standardized NAS terminal & enroute AND WILL BE DELIVERABLE TO AAF. usage of six A/G antennas in Air Traffic Control operations.
ON OR ABOUT 11/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Antenna evaluation completed | 7/79 |
| 2. Omni-Directional priority antenna TDP delivered to AAF | 6/79 |
| 3. TDP delivered to AAF | 11/79 |

14. FOOTNOTES:

I 062-221-03

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 062-221-04

3. REVISION:

4. START DATE: 8/78

5. TITLE OF PROJECT: Helicopter Communications

6. MANAGER/ORGANIZATION: O. J. DeZoute, ARD-223

7. REQUIREMENT: Helicopter Operations Development Prog. Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-330 NPD #04-350
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide ATC communications for use in Helicopters operating under Instrument Flight Rules.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will study short-term communication problems, long-term communication problems, propose and develop operational or technical solutions, and perform tests.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT ATC Communication system for IFR Helicopter operations AND WILL BE DELIVERABLE TO AAF ON OR ABOUT 9/82.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Communications study complete | 10/79 |
| 2. Selected communications system tested at NAFEC | 9/81 |
| 3. Selected communications system tested in field | 6/82 |
| 4. TDP to AAF | 9/82 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 063-221-01

3. REVISION:

4. START DATE: 11/77

5. TITLE OF PROJECT: Small Voice Switching System (SVSS)

6. MANAGER/ORGANIZATION: F. Coble, ARD-221

7. REQUIREMENT: 9550 #AAF-75-17

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: NAFEC support to be requested
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide data to support a combined radio (air/ground) and intercom/interphone (ground/ground) communications system to be used in low activity towers.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: An engineering model will be developed and delivered to NAFEC for test and evaluation.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT communications system for low activity towers AND WILL BE DELIVERABLE TO AAF ON OR ABOUT 12/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Engineering Model Delivery | 4/80 |
| 2. Draft TDP to AAF | 6/80 |
| 3. TDP to AAF | 12/80 |

14. FOOTNOTES:

I 063-221-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 064-221-01

3. REVISION:

4. START DATE: 11/73

5. TITLE OF PROJECT:
National Airspace Data Interchange Network (NADIN)

6. MANAGER/ORGANIZATION:
C. LaRue, ARD-222

7. REQUIREMENT: ARD-1 letter to AAT-1 dated 9/17/75

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide engineering and consulting service for NADIN I, NADIN II and NADIN Enhacement.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will assist AAF with production contract and acceptance testing for NADIN I; conduct system design studies and perform network analyses for NADIN II; prepare procurement specification data for hardware and software for NADIN enhancement.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Packages, are, XXX INTENDED TO SUPPORT AAT program for NADIN Enhancement AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 1/80 and 4/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contract awarded for level II enhancement study | 2/79 |
| 2. TDP handoff for models I and II FSS complete | 1/80 |
| 3. Handoff of balance of TDP and procurement specs for Level II to AAF | 4/81 |

14. FOOTNOTES:

I 064-221-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 064-221-02

3. REVISION:

4. START DATE: 10/78

5. TITLE OF PROJECT: ELT/SAR Support

6. MANAGER/ORGANIZATION: N. R. Anderson ARD-223

7. REQUIREMENT: 9550 No. AFS-100-78-162

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: NASA FA79WAI-002

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide data on which to base minimum performance standards for Emergency Locator Transmitters used for search and rescue operations.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NASA support, will procure at least 100 preproduction ELTs from a variety of manufacturers, built to specifications developed by FAA/NASA. Tests will be conducted at manufacturer's facilities, at an independent test and evaluation facility, and in the field. Results will be analyzed and incorporated into a report to AFS.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT issuance of a Technical Standard Order to establish ELT performance standards. AND WILL BE DELIVERABLE TO AFS.

ON OR ABOUT 6/82.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Procurement Request forwarded to ALG | 2/80 |
| 2. ELTs delivered to AFS for field testing. | 11/81 |
| 3. Report to AFS - validated ELT minimum performance standards. | 6/82 |

14. FOOTNOTES:

I 064-221-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 065-221-01

3. REVISION:

4. START DATE: FY-77

5. TITLE OF PROJECT: Automated Communications System Control Development

6. MANAGER/ORGANIZATION: N. R. Anderson, ARD-223

7. REQUIREMENT: FAA-ED-06-1 (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: NPD #06-361
b. TSC:
c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a technical control and remote maintenance monitoring system.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will develop hardware, software, and techniques as required to permit the voice, radio, and data subsystems of the ATC communications system to provide a total system-wide monitoring, control, restoration and maintenance function.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports, are XXXEX INTENDED TO SUPPORT a technical control & remote maintenance AND WILL BE DELIVERABLE TO SRDS.
monitoring system.
ON OR ABOUT as developed.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Sizing study completed | 3/79 |
| 2. Draft system control concept for integrated communication control system | 9/79 |

14. FOOTNOTES: Other milestones will be added after completion of concept.

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 066-221-01

3. REVISION:

4. START DATE: 4/76

5. TITLE OF PROJECT: Communication Sustaining Engineering

6. MANAGER/ORGANIZATION: N. Anderson, ARD-223

7. REQUIREMENT: ARD-1 ltr to ANA-1 dated 4/7/76

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide the operating services with enhancements and modifications to existing communications systems to improve operational capability, reduce cost or improve inservice maintainability.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: NAFEC will exercise full technical responsibility for carrying out efforts as they are assigned.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report and/or technical data, IS INTENDED TO SUPPORT ongoing operational communications systems. AND WILL BE DELIVERABLE TO SRDS/Operating Services. ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. T&E and analysis of Antenna Multicoupler Devices completed | 10/78 |
| 2. Data Report to ARD-220/AAF-440 | 11/78 |
| 3. Technical report to AAF-1 | 12/78 |

14. FOOTNOTES: Other milestones will be added as requested by Operating Services

07 APPROACH AND LANDING SYSTEMS

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 071-412-02

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT: Marking and Lighting for Unpaved Runways

6. MANAGER/ORGANIZATION: J. W. Simeroth ARD-432

7. REQUIREMENT: 9550 Equivalent letter from New Jersey

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-430 NPD #07-493
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop requirements and equipment necessary for a standard for marking and lighting unpaved runways.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will install and test lighting and marking systems, collect and analyze data, and make recommendations for establishing requirements for marking and lighting.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT a national standard AND WILL BE DELIVERABLE TO AAP and New Jersey.

ON OR ABOUT 1/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Select sites for in-service testing | 10/78 |
| 2. Complete data collection | 7/79 |
| 3. Technical data package complete | 1/80 |

14. FOOTNOTES:

II 071-412-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 071-412-04

3. REVISION:

4. START DATE: 9/75

5. TITLE OF PROJECT: Low-Cost VASI

6. MANAGER/ORGANIZATION: John Simeroth, ARD-432

7. REQUIREMENT: 9550 #AAP-502-76-2

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-430 NPD #07-493
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop requirements and equipment for a standard for low-cost visual approach slope indicators for general aviation and unpaved runways.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will test and evaluate VASI devices, collect data and make recommendations for requirements necessary for use by General Aviation in unpaved runways.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Data for VASI standard, IS INTENDED TO SUPPORT standard requirements AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT 6/79 - 8/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Decision for in-service testing | 12/78 |
| 2. If no in-service testing, Final Report to AAP | 6/79 |
| 3. If in-service testing is done, furnish data for standard | 1/81 |

14. FOOTNOTES:

II 071-412-04

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 071-412-05

3. REVISION:

4. START DATE: 3/77

5. TITLE OF PROJECT:
MALS, MALSF, and MALSR Threshold Lights

6. MANAGER/ORGANIZATION:
John Simeroth, ARD-432

7. REQUIREMENT:
9550 #AAF-76-23

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-430 NPD #07-493

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide a recommended system components and installation criteria to incorporate threshold lighting fixtures into subject facilities.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will review available components, procure and perform laboratory and flight tests on equipment and report results to AAF.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data, IS INTENDED TO SUPPORT Threshold Lights Standard AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Report to AAF | 12/78 |

14. FOOTNOTES:

II 071-412-05

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 071-412-07

3. REVISION:

4. START DATE: 5/77

5. TITLE OF PROJECT:
Intensity Settings of Light Systems

6. MANAGER/ORGANIZATION:
John Simeroth, ARD-432

7. REQUIREMENT:
9550 #AAP-550-77-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-430

b. TSC:

c. OTHER: NAVY (NAEC)
IAA DOT FA 77 WAI-786

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine the optimum intensity settings for various airport lighting systems as a function of visual range luminance and background luminance.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will analyze existing reports, prepare testing requirements, perform flight tests and photometric measurements at NAFEC and/or other airports.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Report/Proposed Standard, IS INTENDED TO SUPPORT US - recommendation to ICAO and operational standard AND WILL BE DELIVERABLE TO AAP ON OR ABOUT 4/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete final contractor report | 1/79 |
| 2. Complete testing and data collection | 8/79 |
| 3. Complete proposed standard | 4/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 071-412-08

3. REVISION:

4. START DATE: 3/77

5. TITLE OF PROJECT: Temporary Obstruction Lights

6. MANAGER/ORGANIZATION: John Simeroth, ARD-432

7. REQUIREMENT: 9550 #AAT-200-16

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-430 NPD #07-493

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide photometric and technical data so that industry can develop fixtures suitable for use as obstruction lighting during the construction phase.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will determine requirements, availability of off-the-shelf equipment which will meet the requirements, analyze data, and prepare final report.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data, IS INTENDED TO SUPPORT Advisory Circular/Spec. for Temporary Obstruction Lights AND WILL BE DELIVERABLE TO AAT ON OR ABOUT 6/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete photometric and environmental testing if required | 12/78 |
| 2. Complete final report | 1/79 |
| 3. Provide data for Advisory Circular | 6/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 071-713-02

3. REVISION:

4. START DATE: 6/76

5. TITLE OF PROJECT: ILS Sustaining Engineering (GS Endfire Array)

6. MANAGER/ORGANIZATION: V. Bencivenga, ARD-720

7. REQUIREMENT: 9550 #ARM-ARD-78-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-310 NPD #07-316

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide glide slope service at certain limited terrain or tidal problem sites not suitable for the standard glide slope antenna.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will test and evaluate different configurations of the GS Endfire Array and utilize such data collected to prepare production specifications.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Production Specifications, IS INTENDED TO SUPPORT Siting problems AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 7/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete test of standard antenna | 12/78 |
| 2. Complete capture effect version evaluation. | 5/79 |
| 3. Provide specification | 7/79 |

14. FOOTNOTES:

II 071-713-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 071-713-04

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT:
ILS Sustaining Engineering (Dev. Slotted Cable Localizer)

6. MANAGER/ORGANIZATION:
V. Bencivenga, ARD-720

7. REQUIREMENT:
AAF Letter dated 6/21/77

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-310 NPD #076-316

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide specifications for a slotted cable localizer antenna, antenna to provide a front and back course, low-profile frangible type antenna.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will test and evaluate the duel frequency (C.E.) slotted cable localizer, contributing to the preparation of production specifications.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Production Specifications, IS INTENDED TO SUPPORT Slotted Cable Localizer AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete Field test | 12/78 |
| 2. Provide specifications | 12/78 |

14. FOOTNOTES:

II 071-713-04

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 071-713-08

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT:
Develop Modified Waveguide GS Array

6. MANAGER/ORGANIZATION:
V. Bencivenga, ARD-720

7. REQUIREMENT:
AAF-420 Letter dated 6/21/77

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-310 NPD #07-316

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide engineering support to the field to solve siting problems and mod kits for the Glide Slope Array.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, is completing the engineering support identified in this resume, resulting in a final report.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Engineering Support/Modification kits, IS INTENDED TO SUPPORT siting problems AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Report | 12/78 |

14. FOOTNOTES:

II 071-713-08

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 071-713-09

3. REVISION:

4. START DATE: FY-76

5. TITLE OF PROJECT: Develop and maintain ILS Modulation Standards at NBS

6. MANAGER/ORGANIZATION: Forrest Yetter, ARD-732

7. REQUIREMENT: Follow-on effort to a completed 9550, to establish Modulation Standards for ILS

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-310 NPD #07-316
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: establish criteria for Standard for ILS Modulation.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will perform a mathematical analysis that will lead to public announcement of a Primary Standard.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Primary Standard, IS INTENDED TO SUPPORT ILS Modulation Standard AND WILL BE DELIVERABLE TO _____.

ON OR ABOUT _____.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Report - NBS primary standard | 1/79 |

14. FOOTNOTES:

II 071-713-09

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 072-424-01

3. REVISION:

4. START DATE: 6/70

5. TITLE OF PROJECT:
Test and Evaluate Frangible Lights and Structures

6. MANAGER/ORGANIZATION:
S. Cannistra, ARD-431

7. REQUIREMENT: 9550s
#AAF-76-11 AAF-560-77-10

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-430 NPD #07-493

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop low-impact resistence light fixtures.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will test and evaluate low-impact resistance structures. Tests will include striking structure with catapult and wind tunnel tests.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Low-Impact resistance light fixtures report, IS INTENDED TO SUPPORT Standard Approach Light System Installation AND WILL BE DELIVERABLE TO AAF/AFS.

ON OR ABOUT 11/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Report | 11/78 |

14. FOOTNOTES:

II 072-424-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 073-720-01

3. REVISION:

4. START DATE: 10/76

5. TITLE OF PROJECT:
Head-Up Displays (HUD) (Simulation)

6. MANAGER/ORGANIZATION:
William B. Davis, ARD-743

7. REQUIREMENT: AFS-1 ltr to ARD-1 7/20/76 - ADA-1 ltr to NASA 9/2/76 FAA/NASA HUD Program Req.

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-430

b. TSC:

c. OTHER: NASA Ames; Interagency Agreement NASA-NMI-1052-151

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide AFS with basis for determining what contribution to safety is made by using Head-Up Displays in operation of large turbojet airplane.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: NAFEC will assist SRDS and NASA in the project by conducting review of literature and performing ongoing research.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT AFS determination of safety factor provided by use of HUD AND WILL BE DELIVERABLE TO AFS-1 ON OR ABOUT 1/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Lab and simulation tests to select candidate HUD | 1/79 |
| 2. Full crew operational manned simulation using candidate HUDs. | 6/79 |
| 3. Final report (simulation and flight test: FAA/NASA coordinated.) | 8/79 |

14. FOOTNOTES:

II 073-720-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 073-720-02

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT: Head-Up Displays (HUD) Evaluation - Flight Test

6. MANAGER/ORGANIZATION: William B. Davis, ARD-730

7. REQUIREMENT: AFS-1 ltr to ARD-1 4/20/76; AOA ltr to NASA 9/21/76 FAA/NASA program request

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-310
   b. TSC:
   c. OTHER: NASA Ames Interagency Agreement NASA-NMI-1052-151

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: evaluate performance of HUD system in a turbojet aircraft of the current Air Carrier fleet.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will select, test and evaluate a candidate HUD system.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Flight Test Report, IS INTENDED TO SUPPORT HUD concept in Agency B-727 aircraft AND WILL BE DELIVERABLE TO _____.

ON OR ABOUT 3/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Select candidate HUD system | 11/78 |
| 2. Interim flight test report | 11/79 |
| 3. Final flight test report | 3/80 |

14. FOOTNOTES:

II 073-720-02

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 075-725-01

3. REVISION:

4. START DATE: 1971

5. TITLE OF PROJECT: Develop Microwave Landing System

6. MANAGER/ORGANIZATION: Frank L. Frisbie, ARD-700

7. REQUIREMENT: National Plan for Development of MLS

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-310 NPD #07-315
   b. TSC: TSC-632 PPA #FA-635
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Develop and implement new terminal guidance system with improved accuracy and operational flexibility.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Prototype systems of various configurations will be developed. Test and evaluation will be accomplished at NAFEC to verify performance capabilities. This will be followed by tests at actual airports to gain initial operational experience with user participation.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Production Specs./TDP, IS INTENDED TO SUPPORT implementation/procurement plans for MLS AND WILL BE DELIVERABLE TO AAF ON OR ABOUT 10/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete ICAO Standard and Recommend practices (SARPS) | 1/79 |
| 2. Technical Data Package Hand-off for STEP (Small Community/Basic Narrow) | 2/79 |
| 3. Technical Data Package Handoff (Basic Wide/ Expanded Configuration) | 10/81 |

14. FOOTNOTES:

II 075-725-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 075-725-03

3. REVISION:

4. START DATE: 10/77

5. TITLE OF PROJECT:
Test and Evaluate TSC Low Cost Small Community TRSB MLS

6. MANAGER/ORGANIZATION:
V. Bencivenga, ARD-700

7. REQUIREMENT:
National Plan for Development of MLS

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-310

b. TSC:

c. OTHER:
Meyer Association

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide data on Time Referenced Scanning Beam for MLS.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Low cost small Community MLS will be installed at NAFEC. Field, flight, and monitor tests will be conducted.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Report, IS INTENDED TO SUPPORT _____ AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete field tests | 10/78 |
| 2. Complete monitor tests | 11/78 |
| 3. Report on system and monitor | 12/78 |

14. FOOTNOTES:

II 075-725-03

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 075-725-04

3. REVISION:

4. START DATE: 11/1/78

5. TITLE OF PROJECT: MLS Avionics Standards

6. MANAGER/ORGANIZATION: Paul M. Rich, ARD-732

7. REQUIREMENT: National Plan for Development of MLS.

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-300
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Provide data from which functional and operational performance standards for MLS avionics will be established.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will develop preliminary standards, conduct flight tests and real-time ATC simulations. Results will be coordinated with Industry.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, MLS Avionics Standards, IS INTENDED TO SUPPORT Technical standard order for MLS avionics AND WILL BE DELIVERABLE TO AAT, AFS and Industry.

ON OR ABOUT 7/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete flight tests | 4/79 |
| 2. Finalize MLS avionics standards | 7/80 |

14. FOOTNOTES:

II 075-725-04

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: II 076-711-01

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT:
Aircraft Alert Systems Standardization Studies

6. MANAGER/ORGANIZATION:
John F. Hendrickson, ARD-733

7. REQUIREMENT:
AFS-1 ltr to ARD-1 10/9/74

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-310 NPD #07-316

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop quidelines for standardization of cockpit alert/warning and monitoring systems.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will evaluate candidate alerting concepts and publish reports containing recommendations/conclusions concerning guidelines for standardization of cockpit alert/warning and monitoring systems.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Study Reports, IS INTENDED TO SUPPORT New Aircraft Certification Requirements AND WILL BE DELIVERABLE TO AFS-1.

ON OR ABOUT 9/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Award Contract | 11/78 |
| 2. Definition of candidate system concepts - report | 6/79 |
| 3. Evaluation of candidate alerting system concepts - reports | 4/80 |
| 4. Cockpit alert guidelines - report to AFS | 9/80 |

14. FOOTNOTES:

Crew activity leve[illegible] e considered for the prioritization of systems. II 076-711-01

08 AIRPORT / AIRSIDE

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 081-402-02

3. REVISION:

4. START DATE: 8/77

5. TITLE OF PROJECT: Approach Light Aiming

6. MANAGER/ORGANIZATION: E. Schaeffer

7. REQUIREMENT: 9550 No. AFS-200-77-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: NAFEC Lakehurst, N.J. FA77WAI-786

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine the best vertical angle to aim the various types of approach lights for the several types of approaches.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will conduct a study of the existing lighting systems. If deemed necessary, actual testing will be performed and evaluation made.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical data package, IS INTENDED TO SUPPORT revision of ALS aiming standards AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 6/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Final report issued | 10/78 |
| 2. Data package (if no testing) | 11/78 |
| 3. Technical data package (if T&E is performed) | 6/79 |

14. FOOTNOTES:

I 081-402-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 081-402-03

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT:

Improve the Airport Taxiway Guidance System

6. MANAGER/ORGANIZATION:

R. Kerr ARD-432

7. REQUIREMENT:

9550 No. AAP-502-77-15

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC:

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide improved safety and reliability of operations, and increased aircraft movement rates under all weather conditions.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS with contract support, will conduct a literature search and review previously tried techniques to identify taxiway exists. The most promising techniques will be investigated, developed, tested and evaluated.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Advisory Circular, IS INTENDED TO SUPPORT improved identification of low speed exits. AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT 5/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contract award | 2/79 |
| 2. Report completed | 3/80 |
| 3. Advisory data submitted to AAP | 5/80 |

14. FOOTNOTES:

I 081-402-03

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 081-402-04

3. REVISION:

4. START DATE: 5/78

5. TITLE OF PROJECT:
Use of Plastic Lenses in Airport Lighting

6. MANAGER/ORGANIZATION:
E. Schaeffer ARD-432

7. REQUIREMENT:
9550 No. AAP-550-78-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a specification for plastic lenses for airport lights so as to provide an alternate competitive material to glass.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will review applicable reports prepared by Defense Documentation Center on plastic lenses. Performance will be incorporated into a specification.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Advisory Circular Data, IS INTENDED TO SUPPORT improved method to specify plastic lenses for airport lights. AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Furnish technical data package including draft specification | 12/78 |

14. FOOTNOTES:

I 081-402-04

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 081-402-05

3. REVISION:

4. START DATE: 4/28/78

5. TITLE OF PROJECT:
Evaluation of Precision Approach Path Indicator (PAPI)

6. MANAGER/ORGANIZATION:
R. Kerr ARD-432

7. REQUIREMENT:
9550 No. AAP-550-78-2

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-440

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine the relative performance and cost effectiveness of PAPI system as a standard visual approach slope indicator for the U.S. with respect to currently employed red/white VASI and Australian T-VASI.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: With NAFEC support, SRDS will acquire and install a PAPI system at NAFEC, and also at an operational site, for evaluation. Reports will be prepared on each evaluation.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT Standards for PAPI AND WILL BE DELIVERABLE TO _____.

ON OR ABOUT 7/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Reinstall PAPI at Operational Site | 4/79 |
| 2. Collect operational data and prepare final report - Phase I | 5/80 |
| 3. Perform cost-benefit analysis and prepare final report - Phase II | 7/80 |

14. FOOTNOTES:

I 081-402-05

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 081-431-1

3. REVISION:

4. START DATE: 6/73

5. TITLE OF PROJECT:
Test and Evaluate CFR Equipment and Agents

6. MANAGER/ORGANIZATION:
J. Szymkowicz ARD-420

7. REQUIREMENT:
SRDS Sponsored Project

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-420 NPD No. 08-472

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine the ability of new formulations of firefighting equipment and foam agents to control and extinguish fuel spill pool fire.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Equipment and foam agents will be purchased, tested and evaluated at NAFEC and results reported to AAP.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports, IS INTENDED TO SUPPORT Airport Firefighting Advisory Circular and Certification AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT 6/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. New formulations and equipments | 12/78 |
| 2. Test and evaluate | 6/79 |
| 3. Final reports | 6/80 |

14. FOOTNOTES:

I 081-431-1

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 081-431-03

3. REVISION:

4. START DATE: 1/77

5. TITLE OF PROJECT: Emergency Planning Services at Airports

6. MANAGER/ORGANIZATION: Herman D'Aulerio

7. REQUIREMENT: 9550 No. AAP-502-77-5

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop emergency medical service plans for civil airports, to insure expeditious and effective crash rescue procedures on and between airports.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, jointly with HEW and with contract support, will develop emergency medical service plans and forward reports to AAP.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Report, IS INTENDED TO SUPPORT Advisory Circular and Certification AND WILL BE DELIVERABLE TO AAP of Airports.

ON OR ABOUT 5/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contract award | 1/79 |
| 2. Plan for Great Lakes Region | 5/79 |
| 3. Final Report to AAP | 5/80 |

15. REMARKS:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 081-431-04

3. REVISION:

4. START DATE: 10/78

5. TITLE OF PROJECT:
Control of Birds on and Near Airports

6. MANAGER/ORGANIZATION:
Herman D'Aulerio ARD-420

7. REQUIREMENT:
9550 Nos. AAP-700-78-2,3,4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine an effective means of controlling birds on or in the vicinity of the airport.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will investigate use of chemicals, landscaping techniques, and improved "scare" techniques.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Report, IS INTENDED TO SUPPORT Airport Advisory Circulars AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT 7/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Landscape techniques report | 12/79 |
| 2. Scare device report | 1/80 |
| 3. Chemicals report | 7/81 |

14. FOOTNOTES:

I 081-431-04

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 082-420-02

3. REVISION:

4. START DATE: 6/74

5. TITLE OF PROJECT: New Pavement Design Methodology

6. MANAGER/ORGANIZATION: H. Tomita ARD-431

7. REQUIREMENT: Program Plan FAA-ED-08-2

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: Army Corps of Engineers, Waterways Experiment Station (WES) 1AA FA73WAI-377 (WES)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide a design method for flexible and rigid pavement.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will investigate different methods of pavement design based on layered elastic theory and non-destructive pavement evaluation technique.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports, IS INTENDED TO SUPPORT ADAP construction AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT variable.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Report and computer code for layered elastic rigid pavement design | 3/79 |
| 2. Final report, Evaluation Subsystem | 9/82 |
| 3. Final Report, Cost Analysis and Life Cycle Management Subsystem | 6/83 |

14. FOOTNOTES:



RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 082-420-03

3. REVISION:

4. START DATE: 6/74

5. TITLE OF PROJECT: Sustaining Engineering

6. MANAGER/ORGANIZATION: M. King

7. REQUIREMENT: Ongoing 9550 requests

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER: Various Government Agencies and Contractors

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support office of Airports Programs by resolving problems incurred during airport construction accomplished with Airport Development Aid Program funds.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract and interagency agreement support, will investigate and recommend solutions to ADAP funded airport construction problems as requested.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports, IS INTENDED TO SUPPORT ADAP requirements AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT as requested.

13. MILESTONE SCHEDULE:

| DESCRIPTION Representative Projects | DATE |
|---|---|
| 1. AAP-502-74-6 - Report Criteria for Expansive Soils | 6/80 |
| 2. AAP-502-74-9 - Report, Shrinkage Compensating Cement | 1/79 |
| 3. AAP-502-77-8 - Report, Dowelling of Keyed Joints | 11/79 |

14. FOOTNOTES:

I 082-420-03

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 082-420-04

3. REVISION:

4. START DATE: 6/74

5. TITLE OF PROJECT: Nondestructive Testing (NDT)

6. MANAGER/ORGANIZATION: H. Tomita ARD-431

7. REQUIREMENT: Program Plan FAA-ED-08-2A (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER: FAA-77-WA-3982 - U. of Perdue
   I AA FA73-WAI-377 - WES

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide specialized research into nondestructive testing of airport pavement.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract and interagency agreement support, will investigate pavement T and E methods to determine those least disruptive/destructive.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports, IS INTENDED TO SUPPORT ADAP Construction AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Report, Frequency sweep NDT method of pavement evaluation and rehabilitation | 4/79 |
| 2. Report, Transfer functions (deflection basin method of nondestructive testing) | 5/79 |
| 3. Report, nondestructive test evaluation method compatible with layered elastic design for flexible pavements | 12/79 |

14. FOOTNOTES:

I 082-420-04

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 082-421-02

3. REVISION:

4. START DATE: 6/74

5. TITLE OF PROJECT:
Airport Improvement Engineering Support

6. MANAGER/ORGANIZATION:
Max H. Coggins ARD-410

7. REQUIREMENT: Letter Requests from AEM and AVP as issued

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide an analysis of airport capacity and delay.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will collect required data on applicable airport operations and forecasts and use developed models to calculate capacity and delay information required for AVP and AEM evalauation studies.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Letter Reports, IS INTENDED TO SUPPORT analyses AND WILL BE DELIVERABLE TO AEM and AVP.

ON OR ABOUT as completed.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Ongoing milestones as they are identified | |

14. FOOTNOTES:

I 082-421-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 082-421-03

3. REVISION:

4. START DATE: 1972

5. TITLE OF PROJECT:
Reduction of Runway Occupancy Time

6. MANAGER/ORGANIZATION:
Max H. Coggins ARD-410

7. REQUIREMENT:
9550 AAP-560-072-2

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide means of reducing runway occupancy time.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will collect and analyze data to formulate a feasible plan. Out-of-agency participation will be obtained to assist in actual testing.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Report, IS INTENDED TO SUPPORT high speed exit utilization AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT *to be determined.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Interm Report | 12/78 |
| 2. Final Summary Report | *TBD |

14. FOOTNOTES: * Completion dependant on future agreement with AAP on requirements and on NASA project schedule.

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 082-421-04

3. REVISION:

4. START DATE: 1/78

5. TITLE OF PROJECT:

Adequacy of Airport Inventory for Future Requirements

6. MANAGER/ORGANIZATION:

R. B. Ahlers ARD-410

7. REQUIREMENT:
ARD-1 Directed Study - Nov. 1977

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop, if feasible, a technique or procedure for assessing the adequacy of airports on both an airport-by-airport and regional set of airports basis.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS with contract support, will collect and analyze data concerning the various factors that impact the adequacy of airports.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT ARD-1 Studies of airport system adequacy AND WILL BE DELIVERABLE TO ARD-1.

ON OR ABOUT 9/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contractor's Report on Adequacy of Airport Inventory for future requirements | 12/78 |
| 2. Report on SRDS review and evaluation of the state-of-the-art on airport planning | 6/79 |
| 3. Program redefinition (based on contract outputs and evaluation of work completed) | 9/79 |

14. FOOTNOTES:

I 082-421-04

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 082-421-05

3. REVISION:

4. START DATE: 2/78

5. TITLE OF PROJECT:
Airport Noise Control - Physical Barriers and Suppressors

6. MANAGER/ORGANIZATION:
R. B. Ahlers ARD-410

7. REQUIREMENT: 9550 Nos. AAP-502-77-3 and AAP-502-77-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER: David Braslau and Assoc.

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: describe the effectiveness and efficiency of existing and proposed noise suppression devices and physical barriers

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will review published and unpublished reports and memoranda belonging to designers, users and owners of noise barriers and suppressors.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports, IS INTENDED TO SUPPORT Airport Noise Control AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT 10/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Report on controlling airport noise with physcial barriers | 10/78 |
| 2. Report on controlling airport noise with ground-based suppression devices. | 10/78 |

14. FOOTNOTES:

I 082-421-05

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 082-431-01

3. REVISION:

4. START DATE: 6/72

5. TITLE OF PROJECT:
Runway Surface Traction (Portland Cement Concrete)

6. MANAGER/ORGANIZATION:
Herman D'Aulerio ARD-420

7. REQUIREMENT:
9550 #AAP-580-72-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-430 NPD #08-459

c. OTHER: FA74WAI-423 Naval Air Engineering Command Lakehurst, N.J.

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop Portland Cement Concrete runway effective; develop cost-effective methods of installing grooves in existing and new runways, and investigator other runway materials for cost-effectiveness.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and Interagency support, will develop test plan, monitor testing and prepare reports.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Interim Report, IS INTENDED TO SUPPORT Airport Advisory Circulars AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Test groove effect on Aircraft tires | 10/78 |
| 2. Interim Report to AAP | 12/78 |

14. FOOTNOTES:

I 082-431-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 082-431-02

3. REVISION:

4. START DATE: 10/77

5. TITLE OF PROJECT: Runway Surface Traction (Bituminous, PFC and PG)

6. MANAGER/ORGANIZATION: Herman D'Aulerio ARD-420

7. REQUIREMENT: 9550 #AAP-502-76-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-400
b. TSC:
c. OTHER: FA74WAI-423 Naval Air Engineering Center - Lakehurst, N.J.

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: be an extension of project 082-431-02 to investigate Porous Friction Course (PFC) surfaces and Plastic Groove (PG) surfaces.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and interagency support, will develop test plan, and test surfaces at selected sites. Other promising surfaces may be selected for test and evaluation.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Report, IS INTENDED TO SUPPORT Airport Advisory Circulars AND WILL BE DELIVERABLE TO AAP.

ON OR ABOUT 3/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Interim Report on Bituminous Surface Performance | 5/79 |
| 2. Interim Report on Plastic Groove Surface Performance | 8/79 |
| 3. Final Report on PFC, Bituminous and PG Performance | 3/80 |

14. FOOTNOTES:

I 082-431-02

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 084-451-01

3. REVISION:

4. START DATE: 7/72

5. TITLE OF PROJECT: Vortex Advisory System

6. MANAGER/ORGANIZATION: H. G. Tinsley ARD-480

7. REQUIREMENT: FAA-ED-21-1A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: NPD No. 08-469
b. TSC: TSC-521 PPA 805
c. OTHER: DOT-TSC-117-IIT Research Institute
DOT-TSC-1135 Arthur D. Little Co.

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop and implement the Vortex Advisory System to provide aircraft inter-arrival separation criteria to increase airport capacity.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and TSC support, will test and evaluate an operational VAS, prepare report on results, publish handbook, and forward a Technical Data Package.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Operational VAS and Tech. Data Package, IS INTENDED TO SUPPORT Vortex Advisory System AND WILL BE DELIVERABLE TO AAF ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Evaluate Operational | 10/78 |
| 2. Final Report VAS Testing | 10/78 |
| 3. Technical Data Package to AAF | 12/78 |

14. FOOTNOTES:

I 184-451-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 084-451-03

3. REVISION:

4. START DATE: 7/72

5. TITLE OF PROJECT: Wake Vortex Avoidance System

6. MANAGER/ORGANIZATION: H. G. Tinsley ARD-480

7. REQUIREMENT: FAA-ED-21-1A/FAA-EM-75-5

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC: TSC-412 PPA #FA 705
   c. OTHER: DOT-TSC-1088 Lockhead
   DOT-TSC-1151 Grumman Aircraft
   DOT-TSC-1152 ITT Research Institute

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support the development and implementation of a Wake Vortex Avoidance System.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with TSC and contract support, will design a system that will predict and track the presence of wake vortices; assess the transport strength and decay; evaluate the hazard; and command required avoidance actions.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT Wake Vortex Avoidance System AND WILL BE DELIVERABLE TO AAT AAF.

ON OR ABOUT 12/83.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. System design complete | 12/83 |
| 2. Design Specifications finalized | 12/83 |
| 3. Test prototype WVAS Operational Suitability | 12/83 |

14. FOOTNOTES:

I 084-451-03

RD FORM 79-1 TEST 9/15/78

# 11 ATC SYSTEMS COMMAND CENTER AUTOMATION

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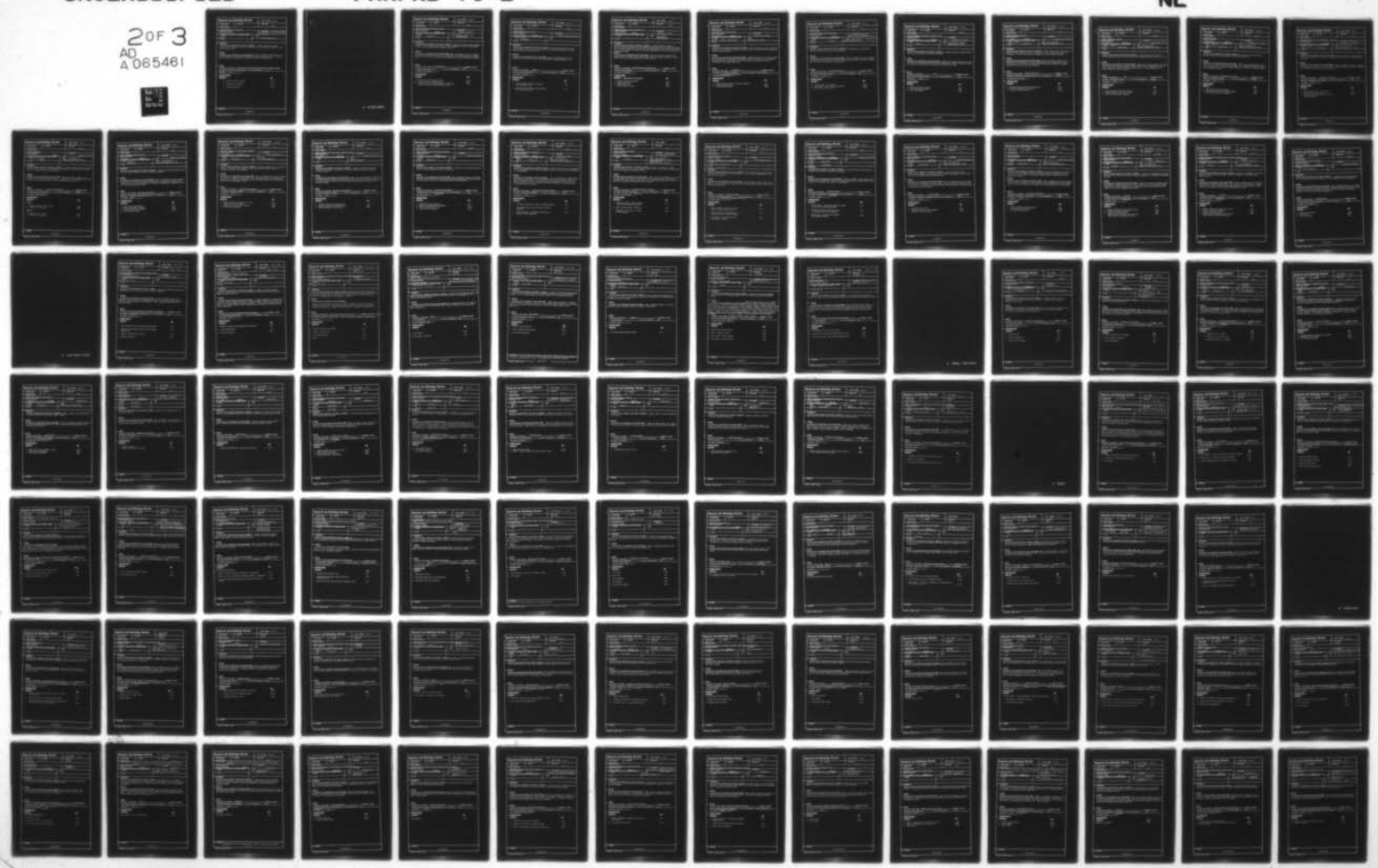

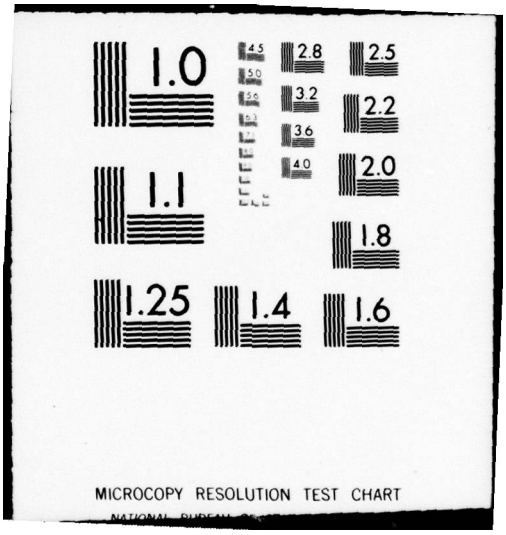
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MICROCOPY RESOLUTION TEST CHART

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 111-102-01

3. REVISION:

4. START DATE: 10/75

5. TITLE OF PROJECT: Central Flow Control Automation

6. MANAGER/ORGANIZATION: Tom Hannan, ARD-102

7. REQUIREMENT: AAT letter 12/24/75 "New Definition of ATC SCC Automation Requirements"

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ARD-140
   b. TSC:
   c. OTHER: DOT FA77 WA-3955 CSC

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop software and system integration for Central Flow Control Automation using the IBM 9020A Computer located at Jacksonville ARTCC.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC, AAF, Regional, and contract support, will purchase and install ancillary computer hardware. Software will be developed, integrated and tested on the 9020A at Jacksonville.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Central Flow Control Operational System, IS INTENDED TO SUPPORT Air Traffic Control Systems Command AND WILL BE DELIVERABLE TO AAT Center ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Software system complete | 10/78 |
| 2. Documentation complete | 12/78 |
| 3. System operational | 12/78 |

14. FOOTNOTES:

I 111-102-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-109-01

3. REVISION:

4. START DATE: 7/75

5. TITLE OF PROJECT:
Computer Software Development Support

6. MANAGER/ORGANIZATION:
Michael Deliman ARD-112

7. REQUIREMENT:
FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ARD-140 NPD #RD-140

b. TSC:

c. OTHER: Computer Sciences Corp.
DOT-FA76WA-3815

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: manage the enroute software support at NAFEC, including direct day-to-day technical management of software development activities being accomplished by support contractors.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will perform technical evaluations of software designs and make appropriate changes. Support will be provided to the technical manager of the enroute software contractor.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Studies/Software, IS INTENDED TO SUPPORT En Route Automation System AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT Continuous.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Delivery of 3d2.7 program to CSC | 12/78 |
| 2. Delivery of 3d2.8 program to CSC | 8/79 |
| 3. Complete EnRoute software manpower facility and laboratory resource requirements for FY-80 | 9/79 |

14. FOOTNOTES:

I 122-109-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-109-02

3. REVISION:

4. START DATE: 7/1/74

5. TITLE OF PROJECT: System Support Facility (SSF)

6. MANAGER/ORGANIZATION: Michael Deliman ARD-112

7. REQUIREMENT: (draft) FAA-ED-12-2B (2/79)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-700
   NPD #RD-140
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide an adequate Air Traffic Control system test bed that is in step with latest development projects in both system hardware and software areas.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will continually update the test bed as new development in hardware/software occur.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, support, IS INTENDED TO SUPPORT En Route system development AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT Continuous.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete EnRoute Tabular Display/SSF Site preparation plan | 11/78 |
| 2. Complete Discrete Address Beacon System/ SSF Interface Software | 11/78 |

14. FOOTNOTES:

I 122-109-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-110-01

3. REVISION:

4. START DATE: 1972

5. TITLE OF PROJECT:
Program Planning and System Engineering

6. MANAGER/ORGANIZATION:
Lauren Douglas ARD-111

7. REQUIREMENT:
FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER: MITRE METREK
DOT FA79WA-4184

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: formulate design concepts of advanced automation capabilities for EnRoute system applications, identify and specify new interface requirements resulting from other E&D programs, assess and define future capacity requirements, and insure that system developments result in design consistent with EnRoute system.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will analyze systems and subsystems, perform concept studies, prepare design definitions, perform test and evaluate designs and document results.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Studies/Specifications/Reports, IS INTENDED TO SUPPORT EnRoute Control Program AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | Representative Milestones | DATE |
|---|---|---|
| 1. | Conflict Alert Enhancements | 3/79 |
| 2. | Flight Plan Probe | 9/79 |
| 3. | EnRoute Metering | 12/79 |
| 4. | ATARS System Interface | 1/80 |

14. FOOTNOTES:

I 122-110-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-111-01

3. REVISION:

4. START DATE: 9/73

5. TITLE OF PROJECT: Surveillance System Improvements

6. MANAGER/ORGANIZATION: James Shannon ARD-111

7. REQUIREMENT: FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ARD-140 ANA-200 NPD #12-125
   b. TSC:
   c. OTHER: FA76WA-3815 CSC (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: make the enroute system tracker more responsive to aircraft twin maneuvers through the use of range rate data from Moving Target Detector equipment.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contractor support, will use MTD data for turn detection modeling; perform field tests for test tapes; prepare simulation test tapes; run full scale tests; and evaluate results for incorporation into Report and/or TDP.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, TDP/Reports, IS INTENDED TO SUPPORT Improvements to EnRoute Automation Safety Related Functions AND WILL BE DELIVERABLE TO SRDS/AAT/AAF. ON OR ABOUT 8/79 & 10/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Coding of mods to enroute software completed | 11/79 |
| 2. System Tests Completed | 4/80 |
| 3. Technical Data Package | 10/80 |

14. FOOTNOTES:

I 122-111-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-111-06

3. REVISION:

4. START DATE: 7/75

5. TITLE OF PROJECT:
Cathode Ray Tube (CRT) Improvements

6. MANAGER/ORGANIZATION:
John Edgbert ARD-113

7. REQUIREMENT: FAA-ED-12B
9550s: AAT-100-34; AAF-77-5 & 6

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-170 SE-190

c. OTHER: Video Products Co. DOTFAA-77AC-7590
Raytheon DOT-FA-76-3029

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop safer, antireflective CRTs with improved performance for EnRoute PVDs.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will procure and test various 23-inch PVD CRTs to obtain optimal optical and safety quality design, and amend Spec. #FAA-E-2537A.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Revised Specification, IS INTENDED TO SUPPORT En Route Planned View Displays AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 11/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. CRT Life Test Letter Reports | 11/78 |
| 2. Final Report - Safe, Antireflective CRT | 12/78 |
| 3. Mod of Spec. #FAA-E-2573A | 12/78 |

14. FOOTNOTES:

I 122-111-06

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-111-08

3. REVISION:

4. START DATE: 10/1/78

5. TITLE OF PROJECT: En Route Tracking Improvement Package (E-TIP)

6. MANAGER/ORGANIZATION: Preston Martin ARD-112

7. REQUIREMENT: FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ARD-140
   b. TSC:
   c. OTHER: DOT-FA76WA-3815 Computer Sciences Corp. (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide improved tracking software for the en route National Airspace System (NAS).

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will code and test the Tracking Improvement Package, and evaluate it against a current version of the NAS to provide basis for appraisal of E-TIPS value to NAS.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, TDP, IS INTENDED TO SUPPORT Improved NAS Stage A Software AND WILL BE DELIVERABLE TO AAT.

ON OR ABOUT 4/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Coding and testing complete | 9/79 |
| 2. Test site report complete | 3/80 |
| 3. Final TDP Complete | 4/80 |

14. FOOTNOTES:

I 122-111-08

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-112-01

3. REVISION:

4. START DATE: 4/75

5. TITLE OF PROJECT: Conflict Alert Enhancements

6. MANAGER/ORGANIZATION: J. P. Dugan ARD-112

7. REQUIREMENT: FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ARD-140
ANA-110 NPD #12-126
b. TSC:
c. OTHER: DOT FA76WA-3815
Computer Sciences Corp (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: reduce false alerts, and assist in detecting conflict alerts when an uncontrolled aircraft, equipped with Mode C, is intruding on a controlled aircraft, to improve the Conflict Alert Subprogram.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will analyze tracking data; develop, test and modify software as required; and provide the operating services with a test NAS Change Proposal and accompanying Computer Program Functional Spec for flight testing.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Test NCP with CPFS, IS INTENDED TO SUPPORT Upgraded 3rd Generation Automation Sys. AND WILL BE DELIVERABLE TO AAT/AAF.

ON OR ABOUT 3/79 & 11/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. ATC operational performance test Complete | 3/79 |
| 2. Software acceptance plan Complete | 6/80 |
| 3. Test NCP and CPFS Complete | 11/80 |

14. FOOTNOTES:

I 122-112-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-112-02

3. REVISION:

4. START DATE: 10/76

5. TITLE OF PROJECT: Conflict Resolution Advisory

6. MANAGER/ORGANIZATION: Preston Martin ARD-112

7. REQUIREMENT: FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ARD-140
ANA-170 NPD #12-126
b. TSC:
c. OTHER: DOT-FA76WA-3815
Computer Sciences Corp (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide computer assistance in resolving potential conflicts when loss of radar separation minima is about to occur.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will make use of flight plan data and tracking information to present a suggested resolution to avoid the potential conflict without creating another. The algorithms will be coded, tested and results evaluated.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, TDP, IS INTENDED TO SUPPORT En Route software development AND WILL BE DELIVERABLE TO AAF/AAT.

ON OR ABOUT 6/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Design evaluation testing complete | 3/79 |
| 2. Quality assurance test spec. complete | 7/79 |
| 3. Technical data package complete | 6/80 |

14. FOOTNOTES:

I 122-112-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-112-03

3. REVISION:

4. START DATE: 7/1/75

5. TITLE OF PROJECT: Flight Plan Probe

6. MANAGER/ORGANIZATION: Preston Martin ARD-112

7. REQUIREMENT: FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ARD-140
   ANA-170 NPD #12-126
   b. TSC:
   c. OTHER: DOT-FA76WA-3815
   Computer Sciences Corp (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide computer assistance in planning conflict free flight paths for controlled aircraft.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will project an aircraft's intended path and compare it against updated flight information for other aircraft that may represent potential conflicts. Probe algorithms will be coded and tested.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Operational Test Report, IS INTENDED TO SUPPORT EnRoute software development AND WILL BE DELIVERABLE TO AAF/AAT.

ON OR ABOUT 7/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. FAA acceptance testing complete | 12/78 |
| 2. Design verification test report complete | 5/79 |
| 3. Operational test report complete | 7/79 |

14. FOOTNOTES:

I 122-112-03

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-112-04

3. REVISION:

4. START DATE: 7/1/75

5. TITLE OF PROJECT:
En Route Minimum Safe Altitude Warning (E-MSAW)

6. MANAGER/ORGANIZATION:
James Dugan ARD-110

7. REQUIREMENT: FAA-ED-12-2B
9550 #AAT-300-23 (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ARD-140
ANA-110 NPD #12-126

c. OTHER: DOT-FA76WA-3815
Computer Sciences Corp (CPFF)

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide software package containing the E-MSAW function for key site testing, and support the national implementation schedule.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will define and develop terrain requirements to support E-MSAW, controller interface with E-MSAW, and reduction of false alert rate.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Operational Software, IS INTENDED TO SUPPORT National implementation of E-MSAW AND WILL BE DELIVERABLE TO AAT.

ON OR ABOUT 6/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Design verification tests complete | 1/79 |
| 2. ATC performance test report | 4/79 |
| 3. Insertion of E-MSAW into 3d2 8 software package complete | 6/79 |

14. FOOTNOTES:

I 122-112-04

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-112-05

3. REVISION:

4. START DATE: 7/1/76

5. TITLE OF PROJECT: En Route Metering

6. MANAGER/ORGANIZATION: Preston Martin ARD-112

7. REQUIREMENT: FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: NPD # pending ARD-140
   b. TSC:
   c. OTHER: DOT FA76WA-3815 Computer Sciences Corp (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: organize traffic at higher altitudes in the en route airspace so that congestion and delays in the terminal area will be kept to a minimum, thereby conserving fuel.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will develop, code and test algorithms (Phase I). Evaluation of test results will be used as basis for enhancements of the en route metering function (Phase II).

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT En route software development AND WILL BE DELIVERABLE TO AAF/AAT.

ON OR ABOUT 8/80 and 8/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Phase I | |
| 1. Design Verification test report | 4/80 |
| 2. Technical Data Package | 8/80 |
| Phase II | |
| 1. Operational test report | 6/81 |
| 2. Technical Data Package | 8/81 |

14. FOOTNOTES:

I 122-112-05

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-112-06

3. REVISION:

4. START DATE: 7/75

5. TITLE OF PROJECT:
Control Message Automation (CMA)

6. MANAGER/ORGANIZATION:
Stan Smith ARD-112

7. REQUIREMENT:
FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ARD-140
NPD #03-108

b. TSC:

c. OTHER: DOT-FA76WA-3815
Computer Sciences Corp (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: refine the controller/computer interface and include additional control and advisory messages.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will modify the en route ATC operational program to automatically formulate and generate various classes of messages for delivery to appropriately equipped aircraft over a two-way digital data link.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, ATC System Test Report, IS INTENDED TO SUPPORT Upgraded 3rd Generation Automation Sys. AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 11/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Definition of Requirements | 1/79 |
| 2. Coding and debugging complete | 5/80 |
| 3. Final documentation delivered | 9/80 |
| 4. ATC System Test Report | 11/81 |

14. FOOTNOTES:

I 122-112-06

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-113-01

3. REVISION:

4. START DATE: 4/74

5. TITLE OF PROJECT:
Electronic Tabular Display Subsystem (ETABS)

6. MANAGER/ORGANIZATION:
John Edgbert ARD-113

7. REQUIREMENT:
(draft) FAA-ED-12-2B

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ARD-140 NPD #21-290

c. OTHER: MITRE
SRI DOT-FATQWA-3911

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop an ETABS that will eliminate need for using paper flight progress strips and minimize repetitive and time consuming controller input actions.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contractor support, will procure an ETABS engineering model for test and evaluation in the NAFEC SSF; analyze UG 3rd automation concepts/functions to determine human factors requirements. Results will be documented in a TDP.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT Automation System Development AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 2/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. NAFEC Test and Evaluation Plan - Draft | 4/79 |
| 2. Hardware delivery to NAFEC | 12/79 |
| 3. ETABS test and evaluation complete | 9/80 |
| 4. Technical Data Package | 2/81 |

14. FOOTNOTES:

I 122-113-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-113-02

3. REVISION:

4. START DATE: 10/77

5. TITLE OF PROJECT:
Radar Position Input and Display Subsystem (RAPID)

6. MANAGER/ORGANIZATION:
John Edgbert ARD-113

7. REQUIREMENT:
FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:
MITRE FAA-69NS-162

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop an improved man-machine interface for the Radar (R) position to minimize repetitive and time consuming controller actions.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will build a breadboard model at MITRE and develop software to prove the viability of RAPID, and to provide adequate information for developing specifications for purchase of an Engineering Model.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT Automation System Development AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 1/85.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Potential operational requirements | 9/79 |
| 2. Complete Controller assessment tests | 7/80 |
| 3. Engineering Model Contract Award | 8/81 |

14. FOOTNOTES:

I 122-113-02

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-113-03

3. REVISION:

4. START DATE: 4/11/75

5. TITLE OF PROJECT:
Radar Display Recording/Playback Subsystem

6. MANAGER/ORGANIZATION:
P. Harris ARD-113

7. REQUIREMENT:
FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-140 NPD #12-125

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide for the recording and playback of all data transmitted to all PVD consoles.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will design, fabricate, test and evaluate a digital recording subsystem and an engineering model. Production specifications and final design data will be developed.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT investigation and evaluation of ATC situations AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Engineering Model Completed | 4/79 |
| 2. Operational demonstration Completed | 7/79 |
| 3. Product Specification draft | 11/79 |
| 4. Technical Data Package | 12/79 |

14. FOOTNOTES:

I 122-113-03

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-114-01

3. REVISION:

4. START DATE: 6/77

5. TITLE OF PROJECT: Hardware Measurement and Analysis

6. MANAGER/ORGANIZATION: Arthur F. Chantker ARD-111

7. REQUIREMENT: FA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-700 NPD #12-777
   b. TSC:
   c. OTHER: DOT-FA76WA-3815 Computer Sciences Corporation

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: assess computer resource requirements of en route hardware and software development efforts, as a function of new automation enhancements.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract and NAFEC support, will measure and evaluate en route enhancements on the system support facility at NAFEC and document results. Improved NAS computer performance will be explored through performance evaluation studies based on measurements of selected releases of the NAS operational system.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Performance Measurement Reports, IS INTENDED TO SUPPORT En Route Automation Development AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 9/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Performance Measurement Report of EMSAW Completed | 1/79 |
| 2. Measurement Report of NAS Operational System Completed | 5/79 |
| 3. Research Report on Performance Measurement of Computer Systems Completed | 9/79 |

14. FOOTNOTES:

I 122-114-01

# Research and Technology Resume

1. DATE OF RESUME:

2. CURRENT NUMBER: I 122-114-02

3. REVISION:

4. START DATE: 4/77

5. TITLE OF PROJECT: Simulation Model Development

6. MANAGER/ORGANIZATION: Arthur F. Chantker ARD-111

7. REQUIREMENT: FAA-ED-12-2B 9550 #AAT-500-20 (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ARD-140
   b. TSC:
   c. OTHER: DOT-FA77WA1-755 Federal ADP Simulation Center
   DOT-FA76WA-3815 Computer Sciences Corporation

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Improve and maintain a viable simulation model of the en route computer system and use it to predict the performance of en route automation development efforts.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will select en route hardware and software enhancements for the simulation model to predict performance and their effect on each other and the NAS operational system. Modeling tools will be improved and maintained to be current.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Performance Prediction Reports, IS INTENDED TO SUPPORT En Route Automation Development Activities AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT As required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Automatic Central Computer Complex Model Load Generation Completed | 3/79 |
| 2. Model Validation Report Completed | 5/79 |
| 3. Simulation of the effect of ETABS on 9020 Computer | 6/80 |

14. FOOTNOTES:

I 122-114-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-114-03

3. REVISION:

4. START DATE: 10/77

5. TITLE OF PROJECT: System Performance Evaluation

6. MANAGER/ORGANIZATION: Arthur F. Chantker ARD-111

7. REQUIREMENT: (draft) FAA-ED-12-2B

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-700, ANA-170 NPD #12-777
   b. TSC: DTS-532 PPA #FA-968
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide additional information for implementation decisions regarding R&D projects, and to assess improvements in their operational environment.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and TSC support, will develop, test and implement an additional testing methodology to measure the relative ATC system performance.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Report, IS INTENDED TO SUPPORT Analysis of En Route Software/Hardware Development Activities AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Report on NAFEC procedures for SSF/ATCSF System Performance Testing | 1/79 |
| 2. System performance measurements of Flight Plan Conflict Probe completed | 9/79 |
| 3. Final Report - System Performance Measurements Completed | 12/79 |

14. FOOTNOTES:

I 122-114-03

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-114-04

3. REVISION:

4. START DATE: 10/77

5. TITLE OF PROJECT:
Controller Performance Evaluation

6. MANAGER/ORGANIZATION:
Arthur F. Chantker ARD-111

7. REQUIREMENT:
FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-170 NPD #12-125

b. TSC:
DTS-532 PPA #FA-968

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide additional information for implementation decisions regarding R&D projects.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and TSC support, will develop, test and implement an additional testing methodology to measure ATC En Route Controller Performance under impact of enhancements.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, *Technical Report*, IS INTENDED TO SUPPORT En Route Software/Hardware Development Activities AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Working Paper - Hypothesized Impact of ETABS on Controller Workload Completed | 1/79 |
| 2. Flight Plan Conflict Probe Controller Performance Measurements Completed | 9/79 |
| 3. Final Report - Controller Performance Measurements Completed | 12/79 |

14. FOOTNOTES:

I 122-114-04

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-115-01

3. REVISION:

4. START DATE: 7/76

5. TITLE OF PROJECT:
DABS Processing in the En Route System

6. MANAGER/ORGANIZATION:
Stan Smith ARD-112

7. REQUIREMENT:
FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-190 NPD #03-108

b. TSC:

c. OTHER: DOT-FA76WA-3815
Computer Sciences Corp. (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: test the surveillance and communications hardware interfaces between the NAFEC System Support Facility (SSF) and each of the DABS Engineering Model sensors.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will develop an interface verification program. This will entail modification of the A3d2.4 en route program to accept and process DABS surveillance and surveillance-related communications messages.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, ATC Test Report, IS INTENDED TO SUPPORT Upgraded 3rd Generation Automation Sys AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Interface Verification | 2/79 |
| 2. DABS/ATC Technical Testing Complete | 8/79 |
| 3. DABS/ATC System Test Report | 12/79 |

14. FOOTNOTES:

I 122-115-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-115-02

3. REVISION:

4. START DATE: 7/75

5. TITLE OF PROJECT: ATARS Processing

6. MANAGER/ORGANIZATION: Stan Smith ARD-112

7. REQUIREMENT: FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-190 NPD #03-108
   b. TSC:
   c. OTHER: DOT-FA76WA-3815 Computer Sciences Corp (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide the operational software in the En Route System Support Facility for incorporating the Automatic Traffic and Resolution Service (ATARS) ground-based collision avoidance subsystem into the NAS En Route system.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will, in Phase I, provide an initial evaluation of the ATARS function and; Phase II achieve a further refinement of the ATARS function interfacing with the ATC system.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, ATC System Test Report, IS INTENDED TO SUPPORT Upgraded 3rd Generation ATC System AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 1/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Design evaluation testing complete | 1/80 |
| 2. ATC System testing complete | 9/80 |
| 3. ATC System Test Report | 1/81 |

14. FOOTNOTES:

I 122-115-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-115-04

3. REVISION:

4. START DATE: 10/1/78

5. TITLE OF PROJECT:
ETABS Software Interface Development

6. MANAGER/ORGANIZATION:
Preston Martin ARD-112

7. REQUIREMENT:
(draft) FAA-ED-12-2B

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ARD-140

c. OTHER: DOT-FA76WA-3815
Computer Sciences Corp (CPFF)

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide for development of software which will test the interface between the ETABS equipment and the NAFEC System Support Facility.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract and NAFEC support, will prepare a software specification. The software will be developed and tested. Results will be used to develop a specification for NAS en route software changes required for national implementation of ETABS.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Software, IS INTENDED TO SUPPORT Interface Testing of ETABS and the NAFEC SSF AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 5/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete software interface specification | 5/79 |
| 2. Software development complete | 1/80 |
| 3. Interface testing complete | 3/80 |
| 4. Computer Program Functional Specification change pages for ETABS/NAS delivered | 5/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-115-05

3. REVISION:

4. START DATE: 10/1/78

5. TITLE OF PROJECT:
Terminal Information Processing System Interface (TIPSI)

6. MANAGER/ORGANIZATION:
Stan Smith ARD-112

7. REQUIREMENT:
FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ARD-140

b. TSC:

c. OTHER: DOT-FA76WA-3815
Computer Sciences Corp (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide for development of software which will test the interface between the TIPS equipment and the NAFEC System Support Facility.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will prepare a software specification. The software will be developed and tested. Results will be used to develop a specification for NAS En Route software changes which will be required for the national implementation of TIPS.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Software, IS INTENDED TO SUPPORT interface testing of TIPS and the NAFEC SSF AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 6/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete software interface specification | 3/79 |
| 2. Software development complete | 12/79 |
| 3. Interface testing complete | 4/80 |
| 4. Computer Program Functional Specification change pages for ETABS/NAS delivered | 5/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 122-116-02

3. REVISION:

4. START DATE: 10/1/78

5. TITLE OF PROJECT:
Data Processing System Development

6. MANAGER/ORGANIZATION:
Arthur F. Chantker ARD-111

7. REQUIREMENT:
FAA-ED-12-2B (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
To be determined

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide the preliminary work that must be accomplished before procurement of a data processing system replacement.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will assess the state-of-the-art in hardware and software, develop guidelines for future en route hardware and software, and perform studies to identify the most cost-effective approach to meet en route computer requirements.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Studies/Reports, IS INTENDED TO SUPPORT En Route Computer System Replacement AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Initial study defined | 12/78 |
| 2. RFP issued | 2/79 |
| 3. Contract awarded | 9/79 |

14. FOOTNOTES:

I 122-116-02

FD FORM 79-1 TEST 9/15/78

13 FLIGHT SERVICE STATIONS

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: I 131-401-02

3. REVISION:

4. START DATE: April 1, 1976

5. TITLE OF PROJECT:

FSS Mass Weather Dissemination Engineering Model

6. MANAGER/ORGANIZATION:

E. Van Vlaanderen, ARD-441

7. REQUIREMENT:

FSS Automation Program

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC:

ANA-250 NPD 13-265

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Improve Mass Weather Dissemination (PATWAS/TWEB) Service through the use of digital technology.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Build a laboratory model using utterance (voice) recognition techniques. Provide single telephone number access for preflight services and route oriented PATWAS. Test, evaluate and demonstrate the laboratory model.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, T&E Report & Technical Data Package, IS INTENDED TO SUPPORT Mass Weather Dissemination Subprogram AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT Sept 1980.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. System Demonstration with Manual Message Update | 11/78 |
| 2. Complete System Demonstration with Auto Message Composition | 1/79 |
| 3. Complete Technical Data Package | 4/79 |
| 4. Complete T&E Report | 8/79 |

14. FOOTNOTES:

I 131-401-02

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: I 131-401-03

3. REVISION:

4. START DATE: April 1, 1976

5. TITLE OF PROJECT:
PATWAS/TWEB Automatic Message Composition

6. MANAGER/ORGANIZATION:
E. Van Vlaanderen, ARD-441

7. REQUIREMENT:
FSS Automation Program

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-250 NPD 13-265

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Develop an automatic message composition capability for use with the Mass Weather Dissemination System Exploratory Design (project 131-401-02).

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: (1) Develop appropriate vocabulary and formats for PATWAS message composition; (2) Convert PATWAS vocabulary to digital form and store in digital memory; (3) Develop linguistic rules to achieve natural sounding speech; and (4) Update PATWAS message automatically by word/phrase concatenation and digital techniques.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Engineering Software Package, IS INTENDED TO SUPPORT FSS Mass Weather Dissemination AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 11/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete Automatic Message Composition Software | 12/78 |
| 2. System Demonstration | 1/79 |
| 3. Final Draft Report | 5/79 |

14. FOOTNOTES:

I 131-401-03

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: I131-401-07

3. REVISION:

4. START DATE: April 1, 1976

5. TITLE OF PROJECT:

Utterance Recognition Performance Improvement and Vocabulary Expansion

6. MANAGER/ORGANIZATION:

E. Van Vlaanderen, ARD-441

7. REQUIREMENT:

FSS Automation Program

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC:

ANA-250 NPD 13-265

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Expand word recognition vocabulary so that more functions such as flight plan filing and weather for selected locations may be accessed by computerized word recognition. Quantify performance for reduced user access time, regional dialects, and expanded vocabulary.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER:

In-house and NAFEC study of flight plan content, methods of filing and utterance vocabulary requirements. NAFEC/Contractor resources will be applied to Utterance Recognition Device design changes for laboratory tests, analysis and demonstration.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Modified Formats and Vocabulary, IS INTENDED TO SUPPORT system demo & the Mass Wx Dissem proj (131-401-02) AND WILL BE DELIVERABLE TO SRDS on or about 11/79.

ON OR ABOUT _____.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete Vocabulary Development | 11/78 |
| 2. Complete Field Testing | 7/79 |
| 3. System Demonstration | 9/79 |
| 4. Report | 11/79 |

14. FOOTNOTES:

I 131-401-07

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: I 131-402-02

3. REVISION:

4. START DATE: Oct 1975

5. TITLE OF PROJECT: Chicago FSS Data Collection and Analysis

6. MANAGER/ORGANIZATION: John Sullivan, ARD-440

7. REQUIREMENT: AAT ltr 6/30/76 - "On Site Data Collection and Analysis"

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-250 NPD 13-265
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Analyze what FSS Specialist work load benefits accrue to the Chicago FSS due to the installation of new equipment at the preflight and TWEB positions.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will collect and analyze data prior to installation, after initial installation, and again after final installation.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT FSS Automation AND WILL BE DELIVERABLE TO AAT.

ON OR ABOUT February 1979.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Draft Report | 11/78 |
| 2. Final Report to Printer | 2/79 |

14. FOOTNOTES:

I 131-402-02

FD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: I 131-402-03

3. REVISION:

4. START DATE: Jul 1, 1977

5. TITLE OF PROJECT: Integrated Graphics Processing and Display for FSS

6. MANAGER/ORGANIZATION: Charles Murray, ARD-440

7. REQUIREMENT: AAT-1 ltr, 1/21/77
Joint ARD-1/ANA-1 ltr, 4/29/77

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-250 NPA 13-265

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Evaluate various techniques, prepare a report and if warranted demonstrate an engineering model of an integrated graphics storage, retrieval, dissemination and display system for Flight Service Stations.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: NAFEC will be requested to evaluate various techniques, prepare a report and, if warranted, develop and test an engineering model of an integrated graphics storage, retrieval and display system for FSS application.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Study Report, IS INTENDED TO SUPPORT the FSS Automation Program AND WILL BE DELIVERABLE TO AAT.

ON OR ABOUT Jun 1979.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Industry Survey Complete | 10/78 |
| 2. Report Drafted and Coordinated | 12/78 |
| 3. Final Report Available | 6/79 |

14. FOOTNOTES: If report is favorable and AAT provides fiscal resources, SRDS will develop a test model and demonstrate in lab. This resume will be revised accordingly.

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: I 131-402-04

3. REVISION:

4. START DATE: Jul 1, 1977

5. TITLE OF PROJECT:
FSS Consolidation/Sectorization

6. MANAGER/ORGANIZATION:
Charles Murray, ARD-440

7. REQUIREMENT: AAT-1 ltr, 1/21/77
Joint ARD/ANA ltr, 4/29/77

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-250 NPD 13-265

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Define productivity improvements to be expected as a result of consolidation; determine if sectorization of briefing and/or inflight work load is feasible.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will collect and analyze data and prepare reports in response to AAT letter.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT FSS Automation AND WILL BE DELIVERABLE TO AAT.

ON OR ABOUT 6/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Consolidation/Sectorization Report | 6/79 |

14. FOOTNOTES:

I 131-402-04

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: I 132-402-01

3. REVISION: 3

4. START DATE: Jan 1976

5. TITLE OF PROJECT: FIS Systems Acquisition

6. MANAGER/ORGANIZATION: William L. Young, ARD-461

7. REQUIREMENT: OST/FAA Study, 12/74
FSS Master Plan, 1/78

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-250

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Technical and program management of the acquisition of automation systems for the Flight Service Station Automation Program.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, has initiated a 2-phase program to automate the present manual Level III (High Activity) Flight Service Stations. Phase I (Design Verification) is a 1-year effort by up to 3 contractors to verify proposed automation system designs. Phase IIa is the production and implementation of the automation equipment at each of 14 ARTCC locations and 43 Level III Flight Service Stations by 1 of the 3 Phase I contractors. The Phase IIa production contract will provide systems with 2 levels of functional capability (Model 1 & Model 2) at each of the designated locations. Phase IIb is the production & implementation of Model 2 automation equipment for the remaining 6 ARTCC locations.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, FSS Model 1 System & Model 2 System, IS INTENDED TO SUPPORT a national automated system for FSS AND WILL BE DELIVERABLE TO NAFEC.

ON OR ABOUT Jan 1981 & Sep 1982.

13. MILESTONE SCHEDULE:

| | DESCRIPTION | DATE |
|---|---|---|
| 1. | Design Verification Complete | 5/80 |
| 2. | Model 1 Production Award | 8/80 |
| 3. | First Model 1 System Delivery | 1/81 |
| 4. | First Model 2 System Delivery | 9/82 |

14. FOOTNOTES:

I 132-402-01

# Research and Technology Resume

1. DATE OF RESUME: October 1, 1978

2. CURRENT NUMBER: I 132-403-01

3. REVISION:

4. START DATE: September 1975

5. TITLE OF PROJECT: Direct User Access - FSS

6. MANAGER/ORGANIZATION: Carey L. Weigel, ARD-441

7. REQUIREMENT: OST/FAA Study 12/74 FSS Master Plan 1/78

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-230 NPD 13-251
   b. TSC: PPA 631
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Provide expansion capability to the FSS so capacity can be increased and future service quality and timeliness enhanced.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and TSC support, will develop a family of self-briefing techniques to permit pilots to directly access a computer weather data base for preflight and inflight weather briefing and flight plan filing. System integration will be accomplished by contract; implementation by AAF.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Direct User Access Packages, IS INTENDED TO SUPPORT FSS Automation AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT Oct 1981.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. VRS National Plan and Initial Specs | 9/79 |
| 2. Direct Access System Integration Contract Award | 10/80 |
| 3. Delivery of First Direct Access Package to AAF | 10/81 |

14. FOOTNOTES:

I 132-403-01

RD FORM 79-1 TEST 9/15/78

14 TERMINAL / TOWER CONTROL

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 142-171-05

3. REVISION:

4. START DATE: 10/1/77

5. TITLE OF PROJECT:
Full Digital ARTS Display Development

6. MANAGER/ORGANIZATION:
R. Simon ARD-120

7. REQUIREMENT:
FAA-ED-14-2 A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: NAFEC supporting division to be determined

b. TSC:

c. OTHER:
Contractor to be determined

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a display which is representative of the state-of-the-art, which can be deployed at all terminal automation facilities.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract and NAFEC support, will design, develop, test and evaluate a display with improved performance, flexibility, maintainability and reliability.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT the All Digital system AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 12/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Contract award | 2/79 |
| 2. NAFEC T&E completed | 9/80 |
| 3. Technical Data Package • | 12/80 |

14. FOOTNOTES:

I 142-171-05

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 142-172-01

3. REVISION:

4. START DATE: 9/74

5. TITLE OF PROJECT: Basic Metering and Spacing

6. MANAGER/ORGANIZATION: Gary Rowland ARD-123

7. REQUIREMENT: FAA-ED-14-2 A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: UNIVAC
DOT-FA75-WA-3556 (CPFF)

b. TSC:

Rocky Mountain Region
IA - ARM-126-A2

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide for the development of a basic metering and spacing capability.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with Regional and contract support, will test and evaluate development programs at NAFEC under simulated conditions. After modification and updating, as required, the programs will be tested under live operating conditions at the Denver TRACON.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Documentation and Report, IS INTENDED TO SUPPORT Arrival Metering and Spacing AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 7/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. NAFEC Verification Test Complete | 2/79 |
| 2. Denver Evaluation Complete | 7/79 |
| 3. Final Documentation | 7/79 |

14. FOOTNOTES:

I 142-172-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 142-173-01

3. REVISION:

4. START DATE: 7/75

5. TITLE OF PROJECT: Terminal Information Processing System (TIPS)

6. MANAGER/ORGANIZATION: N. Aaronson ARD-120

7. REQUIREMENT: FAA-ED-14-2 A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-110 NPD #14-129
   b. TSC:
   c. OTHER: AAT and AAF Region to be determined

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide technical documentation for improved system to handle flight data at high density terminals.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will prepare an Engineering Requirement and required supporting documentation for purchase of an engineering model of TIPS. After testing at NAFEC, the model will be installed and tested at a field site selected by AAT.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT Flight Data Handling for High Density Terminals AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 1/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete T and E at NAFEC | 4/80 |
| 2. Complete T and E at Field Site | 9/80 |
| 3. Complete Technical Data Package | 1/81 |

14. FOOTNOTES:

I 142-173-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 142-176-01

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT:
ARTS III Enhancement (DABS/SRAP Interface)

6. MANAGER/ORGANIZATION:
John Harrocks ARD-123

7. REQUIREMENT:
FAA-ED-14-2 A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-120 NPD #03-110

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: establish, test and evaluate the interface between the Discrete Address Beacon System/Sensor Receiver and Processor systems and a modified Terminal ARTS IIIA system.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will use the newly developed and modified TAMPA software for the T and E, and will develop a Terminal Interface Verification and DABS/SRAP II operational software for both simulated ATCSF and live DABS/SRAP environments.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Evaluation Report, IS INTENDED TO SUPPORT DABS Implementation AND WILL BE DELIVERABLE TO AAT.

ON OR ABOUT 11/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. DABS/Communication Demonstration (ATCSF) | 2/79 |
| 2. DABS/SRAP II User's Manual | 8/79 |
| 3. T & E Evaluation Report | 11/79 |

14. FOOTNOTES:

I 142-176-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 142-179-01

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT: ARTS III Enhancement (TATF Support)

6. MANAGER/ORGANIZATION: J. Horrocks ARD-123

7. REQUIREMENT: FAA-ED-14-2A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-130 NPD #RD-140
   b. TSC:
   c. OTHER: Contractor to be determined

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: update, improve, modify and operate a Terminal Automation Test Facility (TATF) at NAFEC.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will modify, operate and schedule the TATF and provide direction/approval of all hardware/software changes.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, updated TATF, IS INTENDED TO SUPPORT Advanced terminal/tower ATC hardware and software systems AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 8/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. TATF Control Tower available for R&D | 11/78 |
| 2. TATF System 2 Enhancement | 4/79 |
| 3. TATF 9300 Refurbishment | 8/79 |

14. FOOTNOTES:

I 142-179-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 143-102-01

3. REVISION:

4. START DATE: 9/66

5. TITLE OF PROJECT: Basic ASDE-3

6. MANAGER/ORGANIZATION: M. E. Perie ARD-102

7. REQUIREMENT: FAA-RD-78-12 9550 #AAF-320-78-005

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC: ANA-310 NPD #08-396

b. TSC: DTS-522 PPA #FA-921

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support ASDE-3 implementation at qualifying airports.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and TSC support, will procure, install, test and evaluate a basic ASDE-3 radar system. Results will be documented and transmitted to AAF.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT Production Buy of ASDE-3 AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 7/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete evaluation | 7/79 |
| 2. Complete Technical Data Package | 7/79 |

14. FOOTNOTES:

I 143-102-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 143-102-02

3. REVISION:

4. START DATE: 9/66

5. TITLE OF PROJECT: Enhanced ASDE-3

6. MANAGER/ORGANIZATION: M. E. Perie ARD-102

7. REQUIREMENT: FAA-RD-78-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine if a digital scan converter would be an advantageous addition to the Tower Automated Ground Surveillance System.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will enhance the basic ASDE-3 radar system with a digital scan converter and perform testing at NAFEC.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Specification, IS INTENDED TO SUPPORT TAGS prototype procurement AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 4/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete Specifications: Digital Scan Converter | 11/79 |

14. FOOTNOTES:

I 143-102-02

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 143-103-01

3. REVISION:

4. START DATE: 9/66

5. TITLE OF PROJECT: Tower Automated Ground Surveillance System

6. MANAGER/ORGANIZATION: M. E. Perie ARD-102

7. REQUIREMENT: FAA-RD-78-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-430 NPD #08-459
   b. TSC: DTS-522 PPA FA-821
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide technical documentation for TAGS prototype specifications.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and TSC support, will procure a TAGS prototype for testing at an operational airport. Results of the test will be used to prepare a procurement specification.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT TAGS implementation at qualifying airports AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 4/85.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete ATCRBS single sensor testing | 10/79 |
| 2. TAGS prototype delivered | 10/83 |
| 3. Begin operational evaluation | 4/84 |
| 4. Complete TAGS Tech. Data Package | 4/85 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 143-152-01

3. REVISION:

4. START DATE: 6/77

5. TITLE OF PROJECT:
Visual Confirmation of Voice Takeoff Clearance (VICON)

6. MANAGER/ORGANIZATION:
George A. Scott ARD-152

7. REQUIREMENT:
9550 #ATF-77-2

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-430 NPD #07-413

c. OTHER:
ANE-436

b. TSC:
TSC-522 PPA FA-721

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine if a visual confirmation of a voice takeoff clearance is feasible and if it provides an added measure of safety.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: With support from NAFEC, TSC, and Northeast Region, SRDS will install, test and evaluate a VICON system at three takeoff locations at NAFEC (PHASE I). Phase II will entail the installation test and evaluation at a higher density location, and emphasize controller/pilot acceptance and feasibility of integration with ATC system.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT Development of Visual Confirmation Takeoff Clearance System AND WILL BE DELIVERABLE TO AAF ON OR ABOUT 9/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Letter Report (Phase I) | 11/78 |
| 2. Field Trials Complete | 3/80 |
| 3. Final Report (Phase II) | 9/80 |

14. FOOTNOTES:

I 143-152-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 144-170-01

3. REVISION:

4. START DATE: 7/75

5. TITLE OF PROJECT:
Terminal Tower Sustaining Engineering

6. MANAGER/ORGANIZATION:
R. Simon ARD-120

7. REQUIREMENT: FAA-ED-14-2A- 9550s
AAF-640-78-007 - APC-510-78-1
AEA-510-78-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-110 NPD #SE-191

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support ATC facility improvement programs for FAA, other government departments and foreign governments, as required.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with support by NAFEC, Regions, and/or Contractors as appropriate, will conduct tests and evaluations on mockup and/or live test beds. Human factor and environmental considerations will be included.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, *Reports/Studies*, IS INTENDED TO SUPPORT ATC/Other Facility Programs AND WILL BE DELIVERABLE TO AAT/Others.

ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Baltimore Tower Mockup | 12/78 |
| 2. Report - Thermal Analysis and Heat Reduction Study | 3/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I142-120-01

3. REVISION:

4. START DATE: 10/1/77

5. TITLE OF PROJECT: Software Technical Support

6. MANAGER/ORGANIZATION: J. Horrocks ARD-120

7. REQUIREMENT: FAA-ED-14-2A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ARD-143
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support ARTS III Software Development and testing.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will prepare special software packages and conduct design verification tests of ARTS III software.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Software Support, IS INTENDED TO SUPPORT Terminal Program AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. DABS/ATARS Verification Tests | 11/78 |

14. FOOTNOTES:

I 142-120-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I142-121-01

3. REVISION:

4. START DATE: 7/75

5. TITLE OF PROJECT: Program Planning and System Engineering

6. MANAGER/ORGANIZATION: William Fraser ARD-120

7. REQUIREMENT: FAA-ED-14-2A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER: DOT-FA79WA-4184 MITRE Corp.

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support the ARTS III Program Planning and System Engineering.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will prepare analyses and design studies required for the preparation of test plans, engineering specifications and system test reports.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Reports, IS INTENDED TO SUPPORT ARTS III Program AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. TIPS Enhancement Development Plan | 12/78 |
| 2. DABS Design Verification | 6/79 |

14. FOOTNOTES:

I 142-121-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 142-171-02

3. REVISION:

4. START DATE: 8/73

5. TITLE OF PROJECT:
ARTS III Enhancement (Tampa/Sarasota Remoting)

6. MANAGER/ORGANIZATION:
Donald V. Saunders ARD-120

7. REQUIREMENT: FAA-ED-14-2A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ARD-140
ANA-120 NPD #14-129

c. OTHER: UNIVAC
FA75WA-3631 (CPFF)

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop, build and evaluate terminal radar remoting and full digital displays for ARTS Satellite Towers

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will design, build, install and test a prototype system at Tampa, Florida. Sarasota radar information will be remoted to Tampa. Display information will be remoted from Tampa to MacDill, Albert Whitted, Sarasota and St. Petersburg

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT ARTS Satellite Towers AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 5/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Begin test and evaluation of Remote Tower Displays | 11/78 |
| 2. T and E Report and Specification | 5/79 |

14. FOOTNOTES:

I 142-171-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 142-171-03

3. REVISION:

4. START DATE: FY-77

5. TITLE OF PROJECT:
ARTS III Enhancement - Sensor Receiver and Processor (SRAP II)

6. MANAGER/ORGANIZATION:
R. Ramos ARD-120

7. REQUIREMENT:
FAA-ED-14-2 A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-110 ANA-120 NPD #14-167

b. TSC:

c. OTHER: UNIVAC
DOT FA75WA-3631 (CPFF)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop, build and evaluate improved radar/beacon digitizers for future radar/beacon and automation procurements.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will build the SRAP II equipment and evaluate it at NAFEC. A new ARTS III tracker (ARTS/DABS interface) will also be evaluated for performance, when interfaced with the SRAP II (AMPS/MTD)

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT advanced ATC functions AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT 2/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. T&E Report and Specification delivered to AAF | 1/79 |
| 2. NAFEC T and E completed | 1/79 |
| 3. "All Digital" Specification delivered to AAF | 2/79 |

14. FOOTNOTES:

I 142-171-03

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: III 151-462-03

3. REVISION:

4. START DATE: July 1978

5. TITLE OF PROJECT:
Evaluation of Visibility System (Runway Visual Range (RVR)) for Cat IIIB Operations

6. MANAGER/ORGANIZATION:
John Simeroth, ARD-432

7. REQUIREMENT:
ARD-1 ltr, 5/18/78, to ATA

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: Humboldt Co., CA (DOT FA8WA-4251)

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Modify existing RVR systems to provide RVR measurements down to 150 feet (50 meters) and develop a practical RVR system for Category IIIB Operations.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Tasker 500 RVR measuring equipment, with the addition of a 40-foot baseline receiver, will be evaluated to determine its effectiveness for RVR measurements below 600 feet (200 m). Modified single and dual baseline RVR systems will be developed and evaluated to obtain a suitable RVR for practical operations in low visibility conditions.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Report and Specifications, IS INTENDED TO SUPPORT Safety and Capacity of NAS AND WILL BE DELIVERABLE TO AAF and AFS.

ON OR ABOUT May 1982.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Report on evaluation on dual baseline system | 4/80 |
| 2. Installation of modified system for test | 7/80 |
| 3. Final Report | 5/82 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: II 152-461-01

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT:
Improved Aviation Weather Forecasting

6. MANAGER/ORGANIZATION:
Arthur Hilsenrod, ARD-451

7. REQUIREMENT:
Program Plan ED-15-1 (draft)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: National Weather Service, FA-78WAI-866

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Improve the accuracy and timeliness of forecasting and locating hazardous weather.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with Interagency Agreement support, will analyze historical and newly acquired data utilizing radar return processing, plus surface and pilot observations.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Report, IS INTENDED TO SUPPORT Safety and Capacity of NAS AND WILL BE DELIVERABLE TO NWS.

ON OR ABOUT Aug 1981.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Final report - 0-2 hour thunderstorm forecasts published | 8/79 |
| 2. Final report - 0-30 minute forecasts published | 6/80 |
| 3. Complete development test of forecast techniques | 8/81 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: III 152-462-01

3. REVISION:

4. START DATE: 1974

5. TITLE OF PROJECT:
Integrated Aviation Weather System (AWES) for NAS

6. MANAGER/ORGANIZATION:
J. Hinkelman, ARD-452

7. REQUIREMENT: Aviation Weather System Primary Program Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: MSI-DOT FA78WAI-881
DOT FA78WA-4075

b. TSC: PPA 867

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Provide an improved AWES which will, in turn, materially improve weather support to the various ATC facilities.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with TSC, NAFEC, and Contractor support, will adapt existing and new techniques of sensing, forecasting, and reporting weather to ATC and pilot needs.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Aviation Weather System Specs, IS INTENDED TO SUPPORT UPGR 3RD Generation ATC System AND WILL BE DELIVERABLE TO Operating Services.

ON OR ABOUT 10/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. System Preliminary Design | 9/79 |
| 2. System Cost Benefit Studies | 6/80 |
| 3. System Detailed Design | 6/80 |
| 4. System Detailed Specification | 10/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: III 152-462-02

3. REVISION:

4. START DATE: Sep 1978

5. TITLE OF PROJECT: Aviation Weather System Experimental Capability

6. MANAGER/ORGANIZATION: H. Brody, ARD-470

7. REQUIREMENT: Aviation Weather Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER: NWS IAA-DOT-FA78WAI-903
   RFP-LGM-7-7794

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO:
Provide an Aviation Weather System Capability at NAFEC. Resolve issues defined in the Aviation Weather System Preliminary Plan and develop the Aviation Weather NAS design.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER:
An "E Complex" will be established as a part of the en route System Support Facility appropriately interfaced with the Terminal Area Test Facility and the Flight Service Station Laboratory. The System Support Facility will be modified accordingly. Various experiments and tests will be designed and conducted.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Design Reports & On-going Test Reports, IS INTENDED TO SUPPORT Aviation Weather System AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 9/80 through 2/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Establish "E" desk and sector configuration | 6/79 |
| 2. Initial experimental design report | 9/80 |
| 3. AWES experimental test report | 2/81 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: III 152-462-04

3. REVISION:

4. START DATE: 12/77

5. TITLE OF PROJECT:

Severe Weather Tracking and Prediction

6. MANAGER/ORGANIZATION:

J. Hinkelman, ARD-452

7. REQUIREMENT:

AWES Preliminary Program Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC: N/A

b. TSC: N/A

c. OTHER: National Center for Atmospheric Research National Severe Storms Labs, Environmental Research and Technology, Inc. IA DOT-FA7WAI-806

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Develop computer algorithms to provide automated tracking and prediction of radar detected severe weather areas for use in ATC.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, under Interagency Agreement through Department of Interior, has contracted with Environmental Research and Technology (ERT), Boston, MA (an Air Force contractor) to develop and test subject algorithms.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Software Design Report, IS INTENDED TO SUPPORT Aviation Weather System Program AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 10/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Initial Algorithm Development Report | 5/79 |
| 2. Final Software Report | 10/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: III 152-462-05

3. REVISION:

4. START DATE: 1974

5. TITLE OF PROJECT: Doppler Weather Radar Program

6. MANAGER/ORGANIZATION: J. Hinkelman, ARD-452

7. REQUIREMENT: Aviation Weather System

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   c. OTHER: FAA77WAI-724-NOAA, FAA77WAI-807-NOAA
   b. TSC: FAA77WAI-811-NOAA, FAA77AWI-808-NOAA

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Provide an improved integrated aviation weather radar subsystem for ATC which will, in turn, materially upgrade weather radar support to the various ATC facilities.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contractor support, will perform ongoing research and development efforts in the Doppler Weather Radar area and provide reports on findings.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Aviation Weather Support, IS INTENDED TO SUPPORT UGR 3rd Generation ATC System AND WILL BE DELIVERABLE TO AAT/AAF.

ON OR ABOUT as completed.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Representative Milestones: | |
| 1. Report, Storm Echo Detection Capability - Coordinated | 12/78 |
| 2. Report, Rules for Interpretation Modified Radars - Coordinated | 1/79 |
| 3. Correlation Between Radar Reflectivity and Gust Velocities Defined | 1/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: III 153-451-01

3. REVISION:

4. START DATE: June 1973

5. TITLE OF PROJECT: Aviation Automated Weather Observation System (AV-AWOS)

6. MANAGER/ORGANIZATION: Eric Mandel, ARD-452

7. REQUIREMENT: FSS Automation Program Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER: NWS FA73WAI-394
   MITRE

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO:
Provide a completely automated surface weather observation for an airport which duplicates to the maximum extent possible the same information provided by a human observer.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER:

Develop system requirements and specifications in conjunction with the National Weather Service via an Interagency Agreement.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Enhancement of AV-AWOS Spec, IS INTENDED TO SUPPORT FSS Automation Program AND WILL BE DELIVERABLE TO Operating Services

ON OR ABOUT March 1980.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Technical Data Package to AAF | 4/79 |
| 2. Thunderstorm and present weather detection system developed | 12/79 |
| 3. Specifications for enhanced system forwarded to AAF | 3/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: III 153-451-02

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT: Automated Low Cost Weather Observation System (ALWOS)

6. MANAGER/ORGANIZATION: Eric Mandel, ARD-452

7. REQUIREMENT: Aviation Weather Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   c. OTHER: NWS FA78WAI-872
   FA78WAI-4075
   b. TSC:
   MITRE

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Provide weather observations at low activity general aviation airports, primarily those with approved standard instrument approach procedures.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will design, test and evaluate a low-cost automated weather observation system.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT ALWOS AND WILL BE DELIVERABLE TO Operating Services ON OR ABOUT April 1980.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. ALWOS Ready for Test | 12/79 |
| 2. Operational Demonstration and Evaluation | 1/80 |
| 3. Procurement Spec (TDP) Available | 4/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: III 153-451-03

3. REVISION:

4. START DATE: April 1978

5. TITLE OF PROJECT:
Wind, Altimeter, Voice Equipment (WAVE) for General Aviation

6. MANAGER/ORGANIZATION:
Eric Mandel, ARD-452

7. REQUIREMENT:
9550 #AFS-700-78-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Provide wind and altimeter information to pilots in the vicinity of general aviation airports; criteria for standards for commercial systems purchased by non-federal juridictions, and TDP for possible F&E procurement.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will test, evaluate, and demonstrate WAVE system; develop criteria for standards; and prepare TDP.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Data Package, IS INTENDED TO SUPPORT WAVE for General Aviation AND WILL BE DELIVERABLE TO Operating Services.

ON OR ABOUT April 1979.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Publish Advisory Circular for Commercial WAVE | 12/78 |
| 2. TDP Complete | 4/79 |

14. FOOTNOTES:
NWS WAVE will be demonstrated and a Final Report prepared

# Research and Technology Resume

1. DATE OF RESUME: Oct 1, 1978

2. CURRENT NUMBER: III 153-451-05

3. REVISION:

4. START DATE: Oct 1, 1978

5. TITLE OF PROJECT: Test Thunderstorm Detector at Approach Control

6. MANAGER/ORGANIZATION: Eric Mandel, ARD-452

7. REQUIREMENT: AWES EDPP

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Provide a thunderstorm detector which will give distance and direction to storms and display this information graphically on a CRT.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Procure a thunderstorm detector and test it in conjunction with the NSSL in Oklahoma City.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, a Technical Data Package, IS INTENDED TO SUPPORT possible F&E procurement AND WILL BE DELIVERABLE TO AAF.

ON OR ABOUT April 1980.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. PRs Issued | 11/78 |
| 2. Begin Test | 3/79 |
| 3. Tests Complete | 5/80 |
| 4. TDP Complete | 4/80 |
| 5. Final Report Complete | 6/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: III 154-451-01

3. REVISION:

4. START DATE: 11/75

5. TITLE OF PROJECT:
Wind Shear Characterization

6. MANAGER/ORGANIZATION:
H. G. Tinsley ARD-480

7. REQUIREMENT: E&D Program Plan
Wind Shear FAA-ED-15-2A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: NOAA-IAA FA76WAI-622
NASA-IAA FA76WA1-620

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Characterize the wind shear phenomenon and its causes in order to develop realistic wind shear profiles for definition of wind shear hazards and pilot training.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will collect and analyze data and prepare reports on wind shear profiles and gust fronts.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT the Wind Shear Development Program AND WILL BE DELIVERABLE TO AFS/AED/NWS.

ON OR ABOUT 11/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final report on CY-77 gust front data analysis and verification of 3-dimensional gust front model | 11/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: III 154-451-02

3. REVISION:

4. START DATE: 4/76

5. TITLE OF PROJECT:
Wind Shear Hazard Definition Studies

6. MANAGER/ORGANIZATION:
H. G. Tinsley ARD-480

7. REQUIREMENT: E&D Program Plan
Wind Shear FAA-ED-15-2A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
NPD 15-480 ANA-430

c. OTHER: NASA - Ames
1AA FA 76WAI-621

b. TSC:
VITRO FA72WA-3010

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: quantitatively define the wind shear hazard as it affects air carriers and general aviation aircraft to provide thresholds necessary for sensor development and system operation.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract and NAFEC support, will develop a mathematical model for fast time simulation, analyze accident data to establish a correlation between existance and severity of wind shear and type of aircraft.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT Wind Shear Development Program AND WILL BE DELIVERABLE TO SRDS/AFS.

ON OR ABOUT _____.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Develop Hazard Avoidance Criteria | 12/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME:

2. CURRENT NUMBER: III 154-451-03

3. REVISION:

4. START DATE: 7/76

5. TITLE OF PROJECT:
Ground-Based Wind Shear Sensor Development

6. MANAGER/ORGANIZATION:
H. G. Tinsley ARD-480

7. REQUIREMENT: E&D Program Plan
Wind Shear FAA-ED-15-2A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-410 NPD 15-44

c. OTHER:

b. TSC:
TSC-412 PPA-FA-942

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop and evaluate technically feasible and economically acceptable wind shear sensors with emphasis on early implementation.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: various sensors and laser techniques will be compared with accepted tower standards and with each other.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, System Specification Reports, IS INTENDED TO SUPPORT Wind Shear Development Program AND WILL BE DELIVERABLE TO AAF/AFS/AED.

ON OR ABOUT 10/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Decision on most suitable ground sensor | 10/78 |
| 2. Interim NAFEC report on pulse Doppler radar | 10/78 |
| 3. Final Report - T and E of a combined p.j. anemometer, gust front detection system | 10/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: III154-451-04

3. REVISION:

4. START DATE: 11/75

5. TITLE OF PROJECT:
Wind Shear Airborne Studies and Development

6. MANAGER/ORGANIZATION:
H. G. Tinsley ARD-480

7. REQUIREMENT: E&D Program Plan
Wind Shear FAA-ED-15-2A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide improved aircraft control during wind shear encounters; improved communication of wind shear data to the pilot; and pilot avoidance of wind shear encounters during approach.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will analyze procedures and airborne systems which have a potential for providing an airborne solution to the wind shear problem.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports with Specification, IS INTENDED TO SUPPORT Wind Shear Development Program AND WILL BE DELIVERABLE TO SRDS.

ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Report on Phase IV simulation | 12/78 |
| 2. Develop specs for airborne sensors | 1/79 |
| 3. Weather radar ground speed flight tested | 12/79 |

14. FOOTNOTES:

III 154-451-04

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: III 154-451-05

3. REVISION:

4. START DATE: 1/76

5. TITLE OF PROJECT:
Wind Shear Data Management

6. MANAGER/ORGANIZATION:
H. G. Tinsley

7. REQUIREMENT: ED Program Plan
Wind Shear FAA-ED-15-2A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-430 NPD 15-480
ANA-410 NPD 15-414

b. TSC:

c. OTHER: Drexel University FAA-77WA-3938
VITRO Labs FA 72WA-3010

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a wind shear climatology which will support improved wind shear forecasting techniques.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC end contract support will collect, analyze and store data for distribution to any activity desiring data on wind shear. Software program will be developed to provide parametric and statistical analysis of stored data.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Wind Shear Data Base, IS INTENDED TO SUPPORT Wind Shear Climatology AND WILL BE DELIVERABLE TO SRDS

ON OR ABOUT 2/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Complete data processing - Data Collection | 2/79 |

14. FOOTNOTES:

III 154-451-05

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: III 154-451-06

3. REVISION:

4. START DATE: 10/76

5. TITLE OF PROJECT:
Wind Shear System Integration into NAS

6. MANAGER/ORGANIZATION:
H. Tinsley

7. REQUIREMENT: E&D Program Plan
Wind Shear FAA-ED-15-2 A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: improve the techniques for terminal forecasting of wind shear and develop procedures to integrate the wind shear data into NAS.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will analyze the requirements, procedures and techniques to provide the most cost effective and reliable method for forecasting and integrating wind shear data into the system.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT Wind Shear System Development AND WILL BE DELIVERABLE TO AAF/AAT

ON OR ABOUT 8/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Initiate analysis to refine operational requirement | 10/78 |
| 2. Recommended system architecture for various classes of airports | 9/79 |
| 3. Report on recommended system implementation | 8/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 181-520-01

3. REVISION:

4. START DATE: 4/78

5. TITLE OF PROJECT: Anti-Misting Kerosene

6. MANAGER/ORGANIZATION: John Van Dyke

7. REQUIREMENT: FAA-ED-18-1 A AFS letter dtd. 7/15/78

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: reduce or eliminate the fire mist which becomes a fireball when fuel is released during an impact survivable crash.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will test and evaluate an anti-misting additive for fire resistance and compatibility with aircraft engines and fuel systems.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, proposed certification criteria, IS INTENDED TO SUPPORT revised regulatory standards for fuel AND WILL BE DELIVERABLE TO AFS-1.

ON OR ABOUT 9/84.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete large-scale validation tests of FM9 AMK fire resistance | 6/79 |
| 2. Optimize the most feasible degrading concept | 9/80 |
| 3. Complete flight test to validate the compatibility of FM9 AMK and all aircraft systems | 9/84 |

14. FOOTNOTES:

IV 181-520-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 181-521-01

3. REVISION:

4. START DATE: 6/29/74

5. TITLE OF PROJECT:

Method to Assess fire characteristics of Transport Cabin

6. MANAGER/ORGANIZATION:

C. Troha ARD-520

7. REQUIREMENT:

9550 No. AFS-100-76-150

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC:

ANA-44 NPD 18-471

b. TSC:

c. OTHER: NASA JSC I/A FA78WAI-853
UDRI FA74WA-3532

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a math model to simulate a post-crash cabin fire of interior materials; to predict outputs of the smoke, gas and thermal emissions due to conbustion.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS with NAFEC and contract support, will develop model using basic theoretical heat transfer and gas dynamic equations; refine model using previous 1968 AIA cabin fire tests; validate the cabin-fire model using data from full-scale tests performed by NASA-JSC.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Tech. Reports and Users Guide, IS INTENDED TO SUPPORT Model perdictive technique to aid in regulatory process AND WILL BE DELIVERABLE TO AFS.

ON OR ABOUT 9/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete validation tests | 1/78 |
| 2. Evaluate data - FAA-UDRI, NASA | 3/79 |
| 3. Complete Reports | 9/79 |

14. FOOTNOTES:

IV 181-521-01

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV181-521-03

3. REVISION:

4. START DATE: 10/78

5. TITLE OF PROJECT: Cabin Fire Management System

6. MANAGER/ORGANIZATION: C. Troha ARD-520

7. REQUIREMENT: Cabin Fire Safety Program

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: improve emergency escape time for passengers and crew in cabin fire situations.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will investigate detection and communication systems, hazard reduction concepts, fire hardening concepts, and crew/passenger protection. Suggested criteria for regulations on cabin fire hazard will be developed.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical report, IS INTENDED TO SUPPORT AFS regulatory process AND WILL BE DELIVERABLE TO AFS-1.

ON OR ABOUT 11/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Define concepts for evaluation and testing | 10/79 |
| 2. Full-scale tests of optimized system | 11/80 |
| 3. Suggested criteria to AFS | 11/81 |

14. FOOTNOTES:

IV 181-521-03

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 181-521-05

3. REVISION:

4. START DATE: 3/73

5. TITLE OF PROJECT:
Develop Toxic Gas Emissions Criteria for Cabin Interior Materials

6. MANAGER/ORGANIZATION:
R. C. McGuire ARD-520

7. REQUIREMENT:
ED-18-1A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-420 NPD #18-471

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide criteria for regulations governing materials used in aircraft cabin interiors.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will conduct tests to assess effect of different materials, areas, etc. on cabin fire environment.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Criteria Reports, IS INTENDED TO SUPPORT rulemaking process for cabin fire safety AND WILL BE DELIVERABLE TO AFS.

ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final report to AFS on gas measurements, animal and materials test results. | 12/78 |

14. FOOTNOTES:

IV 181-521-05

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 181-521-07

3. REVISION:

4. START DATE: 12/75

5. TITLE OF PROJECT:

Methodology/Criteria to Rank Cabin Material for Total Combustion Hazard

6. MANAGER/ORGANIZATION:

R. C. McGuire ARD-520

7. REQUIREMENT:

9550 No. AFS-100-76-150

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC:

b. TSC:

c. OTHER: Douglas Aircraft

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide a combined Hazard Index for ranking materials as they relate to aircraft cabin fires.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will develop method for establishing a combined Hazard Index for ranking materials, and validate this method.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT regulatory process for cabin fire safety AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Report, method for establishing CHI | 3/79 |
| 2. Final Report, validation of CHI method | 12/79 |

14. FOOTNOTES:

IV 181-521-07

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 181-521-09

3. REVISION:

4. START DATE: 1/1/76

5. TITLE OF PROJECT:
Improve Transport Aircraft Emergency Lighting

6. MANAGER/ORGANIZATION:
R. C. McGuire ARD-520

7. REQUIREMENT:
9550 #AFS-100-76-151

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-420 NPD #18-471

c. OTHER:
CAMI - AAC-119

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine whether addition of floor level lighting system or other lighting/marking concepts improve exit conspicuity.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and CAMI support, will evaluate performance of emergency interior cabin lighting and exit marking standards under adverse conditions, i.e. dark night and black smoke.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Report, IS INTENDED TO SUPPORT emergency interior lighting criteria AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 10/79 for transport aircraft.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Test cabin exit signs and advanced systems in C-133. | 6/79 |
| 2. Final report and recommentations | 10/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 181-521-10

3. REVISION:

4. START DATE: 1/76

5. TITLE OF PROJECT:
Develop Cabin Fire Safety Criteria

6. MANAGER/ORGANIZATION:
R. C. McGuire ARD-520

7. REQUIREMENT: 9550s ARD-500-76-1
AFS-100-76-150 ARD-500-75-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-420 NPD 18-471

c. OTHER: CAMI

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: establish criteria for regulations governing materials and system design used in aircraft cabins.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and CAMI support, will develop a C-133 cabin fire test facility, test, evaluate and recommend performance levels on which to base regulations on cabin safety.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Meterials/System Design Criteria, IS INTENDED TO SUPPORT regulatory process for cabin fire safety AND WILL BE DELIVERABLE TO AFS.

ON OR ABOUT 6/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Define cabin hazard | 6/79 |
| 2. Develop a scale cabin fire modeling technique | 6/80 |
| 3. Validation tests - CHI and Math Modeling | 6/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 181-521-11

3. REVISION:

4. START DATE: 10/1/78

5. TITLE OF PROJECT:

Transport Crashworthy Fuselage Fuel Tanks Safe Location Fuel Studies

6. MANAGER/ORGANIZATION:

H. Spicer ARD-520

7. REQUIREMENT:

AFS Letter Request

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC:

b. TSC:

c. OTHER: NASA

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop design criteria for regulations to reduce and control fire from fuel spills occurring in impact survivable crashes.

11. APPROACH:

*THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER:* SRDS, with NASA support, will investigate trade-off design concepts, develop crashworthy tanks, conduct tests and provide data on which to base regulation criteria.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Reports, IS INTENDED TO SUPPORT improved regulatory standards AND WILL BE DELIVERABLE TO AFS.

ON OR ABOUT 11/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Define crash load envelope | 10/79 |
| 2. Conduct full-scale impact tests | 7/80 |
| 3. Suggested design criteria | 10/80 |

14. FOOTNOTES:

IV 181-521-11

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 181-522-07

3. REVISION:

4. START DATE: 1977

5. TITLE OF PROJECT: Use of Titanium in Aircraft Engines

6. MANAGER/ORGANIZATION: J. J. Shea ARD-520

7. REQUIREMENT: 955 #AFS-100-76-155

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide certification guidelines concerning use of Titanium in turbine engines.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will conduct a literature search, interface with engine manufacturers and other R&D agencies, and compile the data into a report useful to those certificating engines.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Report, IS INTENDED TO SUPPORT certification guidelines for use of Titanium in turbine engines AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 8/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Draft final report | 10/78 |
| 2. Final Report | 11/78 |
| 3. Completion report to AFS | 11/78 |

14. FOOTNOTES:

IV 181-522-07

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-520-01

3. REVISION:

4. START DATE: 7/71

5. TITLE OF PROJECT:
Inflight Aircraft Bomb Sabotage

6. MANAGER/ORGANIZATION:
R. N. Bell ARD-560

7. REQUIREMENT:
9550 ACS-200-75-2

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-410 NPD 18-481

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide guidance to airlines and basis for formulating regulations regarding explosive devices aboard an aircraft.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will study least risk placement and jettisoning of explosive devices, and evaluate aircraft structure for resistance to explosive.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Reports, IS INTENDED TO SUPPORT regulatory process and guidelines to Airlines AND WILL BE DELIVERABLE TO ACS ON OR ABOUT 10/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Complete test program | 10/78 |

14. FOOTNOTES:

IV 182-520-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV182-520-07

3. REVISION:

4. START DATE: 6/77

5. TITLE OF PROJECT: Boston Logan Airplane Towing

6. MANAGER/ORGANIZATION: H.C. Spicer ARD-520

7. REQUIREMENT: AOA-1 Request

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: Lockheed
McDonnell Douglas

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine degree of aircraft damage that can be expected from towing operations to reduce night operation noise levels.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will measure the characteristics and grade levels of noise and extrapolate that data to the type of operations at Boston Logan. This data will be used to evaluate the sort of structural damage that can be expected from additional towing.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Reports, IS INTENDED TO SUPPORT determination of potential aircraft damage from towing AND WILL BE DELIVERABLE TO AFS, AEO, AVP, ATA and Mass. Port Authority ON OR ABOUT 7/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Oral report - lead measurements and fatigue load spectra | 1/79 |
| 2. Oral report - structural evaluation | 5/79 |
| 3. Final technical reports | 7/79 |

14. FOOTNOTES:

IV 182-520-07

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-520-08

3. REVISION:

4. START DATE: 4/77

5. TITLE OF PROJECT: Transport Aircraft Tire Performance

6. MANAGER/ORGANIZATION: R. C. McGuire ARD-520

7. REQUIREMENT: 9550 No. AFS-100-76-156

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER: Lockheed
   McDonnell Douglas
   B. F. Goodrich (R&D)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide data on which to base regulations concerning performance of transport aircraft tires.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will investigate a means of reducing the number of tire failures causing susbtantial aircraft damage and hazard to occupants.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports, IS INTENDED TO SUPPORT rulemaking process AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 9/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Final report - Airborne Tire Pressure Indicating system | 12/78 |
| 2. Final report - Non-destructive Tire Inspection System | 11/78 |
| 3. Final report - Qualify tires for safe overload | 12/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-520-09

3. REVISION:

4. START DATE: 7/78

5. TITLE OF PROJECT: Transport Crashworthiness

6. MANAGER/ORGANIZATION: H. C. Spicer ARD-520

7. REQUIREMENT: E&D Program Plan FAA-18-1 A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER: NASA-Langley

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide basis from which to develop crashworthiness requirements for transport aircraft to improve occupant survivability.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will develop a math model, test and validate crashworthiness concepts, and perform correlation of math model and crash criteria.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Regulation criteria, IS INTENDED TO SUPPORT rulemaking process AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 12/83.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Develop math model for transport crashworthiness | 6/80 |
| 2. Correlation of math model and crash criteria | 8/83 |
| 3. Results and recommendations | 11/83 |

14. FOOTNOTES:



RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-520-11

3. REVISION:

4. START DATE: 1 /79

5. TITLE OF PROJECT: Helicopter Crashworthiness

6. MANAGER/ORGANIZATION: H. Spicer ARD-520

7. REQUIREMENT: FAA Helicopter Research Prog. Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER: NASA, CAMI, Dept. of Army

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide guidelines for the design of components of a helicopter to maximize crashworthiness.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract and inter-agency support, will test and evaluate helicopter components in a crash environment and publish results.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Reports/Design Criteria, IS INTENDED TO SUPPORT helicopter crashworthiness AND WILL BE DELIVERABLE TO Industry - AFS ON OR ABOUT 10/84.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Initial development of crash environments | 1/80 |
| 2. Full scale tests | 6/83 |
| 3. Final criteria | 7/84 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-521-05

3. REVISION:

4. START DATE: 10/1/78

5. TITLE OF PROJECT: Propulsion Safety

6. MANAGER/ORGANIZATION: R. J. Koenig ARD-550

7. REQUIREMENT: FAA-ED-18-1A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide data and recommendations to revise appropriate FARs to improve propulsion safety.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will conduct studies and tests on impact of weather and/or operational requirements on the performance of turbine and piston engines.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, reports and recommendation, IS INTENDED TO SUPPORT revision of FARs to improve propulsion safety AND WILL BE DELIVERABLE TO AFS ON OR ABOUT as required (on going).

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Representative Milestones | |
| 1. Carburator icing | 12/79 |
| 2. Helicopter inlet patterns defined | 1/81 |
| 3. Avgas vs Autogas Feasibility defined | 4/80 |

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-530-03

3. REVISION:

4. START DATE: 7/75

5. TITLE OF PROJECT: The Effects of Atmospheric Disturbances on STOL Approach Handling Qualities

6. MANAGER/ORGANIZATION: Edward M. Booth ARD-531

7. REQUIREMENT: FAA-ED-18-1A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
c. OTHER: NAE Canada AIA/CA-1
NASA-ARC-NMI-1052-151; FA72WAI-285
b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine effect of naturally occurring wind shears and heavy turbulence on landing approach flight characteristics of powered-lift STOL aircraft. Determine level of confidence in past ground-based simulations.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will measure and evaluate the degradation in flying qualities during atmospheric disturbances. Flight tests using the Bell 205A-1 airborne simulator will be performed and results compared with ground simulation data.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT Airworthiness Criteria for STOL a/c AND WILL BE DELIVERABLE TO AFS

ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final report on all tests/analyses | 12/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-530-04 *

3. REVISION:

4. START DATE: 10/75

5. TITLE OF PROJECT: Aircraft Structural Loads Criteria Based on Aircraft and Atmospheric Dynamics

6. MANAGER/ORGANIZATION: Edward M. Boothe ARD-531

7. REQUIREMENT: FAA-ED-18-1A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: Systems Technology, Inc. FAA77WA-3936

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop data to support improved standards for structural flight loads requirements which functionally relate loads to aircraft dynamics, stability and control augmentation, pilot and disturbed atmosphere inputs.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will review regulations and do a study of operating experience associated with accidents/incidents which were loads related.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, *Reports*, IS INTENDED TO SUPPORT Airworthiness Criteria Development AND WILL BE DELIVERABLE TO AFS

ON OR ABOUT 10/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Report (Phase I) | 10/78 |

14. FOOTNOTES: *This is phase I of a two-phase project. Phase II planning was completed in 2/78.

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-530-07

3. REVISION:

4. START DATE: 7/76

5. TITLE OF PROJECT:
Certification Standards for Helicopters in IFR Operations

6. MANAGER/ORGANIZATION:
LTC. T. C. West ARD-530

7. REQUIREMENT:
FAA-ED-18-1A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: PACER Systems, Inc.
FA77WA-3966

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide criteria for further development of handling quality standards and define an evaluation procedure to determine compliance with certification standards.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will perform an analysis of current data available in interviews with personnel involved in current IFR certification of helicopters.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Data and Criteria, IS INTENDED TO SUPPORT Certification Criteria for helicopter IFR operations AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 6/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Technical Briefing | 11/78 |
| 2. Final evaluation report | 6/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-530-09

3. REVISION:

4. START DATE: 2/77

5. TITLE OF PROJECT:
Airworthiness Certification Rules and Flight Test Procedures

6. MANAGER/ORGANIZATION:
J. B. McCullough ARD-530

7. REQUIREMENT:
9550 #AFS-100-77-157

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: Calspan Corporation FATOOC-002

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: clarify FAR Parts 23 and 25 with respect to flight test procedures/techniques.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, under contract, will obtain and analyze student-course feedback information and make recommendation for standardization and/or needed research.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Interpretation Study, IS INTENDED TO SUPPORT Clarification of flight test procedures AND WILL BE DELIVERABLE TO AFS

ON OR ABOUT 10/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Report | 10/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-530-10

3. REVISION:

4. START DATE: 3/77

5. TITLE OF PROJECT: NASA/AMES Digital Flight Control Simulation

6. MANAGER/ORGANIZATION: John E. Reed ARD-530

7. REQUIREMENT: AFS/ARD Coordination on Advanced Integrated Flight System

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: NASA NMI 1052.151

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide support for NASA/Ames Simulation Methods for Advanced Digital Flight Control and Avionic System Program.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, under Interagency Agreement, will conduct simulation experiments, assess hardware and software performance, investigate industry's systems concepts and conduct technical work shops as required to obtain perspective and assessment data on industry's methods.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Generic Data and Reports, IS INTENDED TO SUPPORT Long-term airworthiness criteria AND WILL BE DELIVERABLE TO AFS

ON OR ABOUT Incrementally from 10/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Validation of reliability software | 10/79 |
| 2. Methods for Validation of Flight Software | 11/79 |
| 3. Conduct Systems/Mission Simulation Investigation | 12/81 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-530-11

3. REVISION:

4. START DATE: 4/77

5. TITLE OF PROJECT:
NASA/Langley Lightning Study Flight Tests

6. MANAGER/ORGANIZATION:
John E. Reed ARD-530

7. REQUIREMENT: AFS/ARD Coordination with respect to Advanced Integrated Flight Systems

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:
NASA/FAA-IA-FA77WAI-756

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide data on which to base follow-on investigations on the indirect effects of electromagnetically induced voltages in aircraft systems.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, under Interagency Agreement with NASA, will conduct studies on lightning effects upon avionics systems and perform flight tests for verification of experimental equipment.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Generic Data and Reports, IS INTENDED TO SUPPORT long-term airworthiness criteria AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Conduct experimental equipment Flight Test Verification | 5/79 |
| 2. Verification Test Results | 12/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-530-12

3. REVISION:

4. START DATE: 2/78

5. TITLE OF PROJECT:
Hardware and Software Functional Assessment Concepts

6. MANAGER/ORGANIZATION:
John E. Reed ARD-530

7. REQUIREMENT: FAA-ED-18-3

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER: IA FA78WAI-855

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide research for the functional assessment of advanced computer and software architecture schemes; and the investigation of diagnostic emulator concepts.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, under Interagency Agreement, will collect and analyze data and develop methods to verify that systems designs meet functional performance specifications.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Generic data and/or reports, IS INTENDED TO SUPPORT Long-term airworthiness standards and certification procedures AND WILL BE DELIVERABLE TO AFS incrementally ON OR ABOUT 8/81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Initiate research on functional assessment methodologies | 8/79 |
| 2. Investigate diagnostic emulator concepts | 9/79 |
| 3. Report (first increment) | 10/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-530-13

3. REVISION:

4. START DATE: 4/78

5. TITLE OF PROJECT: Helicopter Icing Technology Review

6. MANAGER/ORGANIZATION: LTC Thomas C. West ARD-530

7. REQUIREMENT: 9550 #AFS-100-78-160

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: Boeing Vertol Co. DOT-FA78WA-4258

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide data upon which to base operational approval for helicopters operating in icing conditions.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will review current state-of-the-art pertinent to helicopter icing standards technology and evaluate current operational data and publish results.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical data and criteria, *IS INTENDED TO SUPPORT* helicopter icing certification standards AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 3/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Draft report | 12/79 |
| 2. Final report | 3/80 |

14. FOOTNOTES:

IV 182-530-13

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-530-15

3. REVISION:

4. START DATE: 5/78

5. TITLE OF PROJECT:
Simulation: Validation and Verification

6. MANAGER/ORGANIZATION:
R. C. Padgett ARD-530

7. REQUIREMENT: AIFS Technical Program Plan FAA-ED-18-3

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: establish guidelines for assuring the validity of simulation data when used for aircraft certification compliance credit.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will run simulations and collect data which will be compared with actual flight information to establish validity.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical data and criteria, IS INTENDED TO SUPPORT simulation data validation AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 11/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Phase I (Evaluation of the state-of-the-art) | 11/79 |
| 2. Phase II (Simulation and comparison) | 9/80 |
| 3. Final Report | 11/80 |

14. FOOTNOTES:



RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 182-530-16

3. REVISION:

4. START DATE: 8/78

5. TITLE OF PROJECT: Helicopter Certification Requirements for Flight in Icing Conditions

6. MANAGER/ORGANIZATION: LTC Thomas C. West ARD-530

7. REQUIREMENT: 9550 #AFS-100-78-160

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC:
   b. TSC:
   c. OTHER: FA78WAI-930 IA U.S. Army Res. & Tech. Lab.

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: form a valid data base upon which to establish ice certification and operations requirements for helicopters operating with minimum ice protection systems capability.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, via Interagency Agreement with the Army, will expand an on-going helicopter icing flight test program. Data to be developed will include equipment systems configuration and operation, environment data, ice accretion, performance, handling qualities, among other data.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Test Reports and Data, IS INTENDED TO SUPPORT Certification Criteria for future civil helicopters AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 8/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Test program initiated | 12/78 |
| 2. Interim report | 6/79 |
| 3. Final report | 8/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 184-520-02

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT:
Lightplane Longitudinal Flight Control Criteria

6. MANAGER/ORGANIZATION:
Joseph W. Howell ARD-530

7. REQUIREMENT:
FAA-ED-18-1 A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: Princeton University
FA75WA-3679

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop quantitative criteria for longitudinal stability and control which can serve as guidelines for advisory and aircraft certification process.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will review and analyze longitudinal stick fixed and stick free static stability characteristics of small general aviation aircraft, with regard to configuration changes and stability devices for low speed landing approach and stall.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports, IS INTENDED TO SUPPORT Improved Airworthiness Certification Criteria AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Complete Final Report | 12/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 184-521-01

3. REVISION:

4. START DATE: 3/72

5. TITLE OF PROJECT:
General Aviation Crashworthiness Design Criteria

6. MANAGER/ORGANIZATION:
Herbert C. Spicer ARD-520

7. REQUIREMENT: FAA-ED-18-1 A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: NASA 8-928-3453 Lockheed DOT IA-DOT-FA76WA-607 FA75WA-3707

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide data on which to base standards for general aviation airplane structure to improve their crashworthiness.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will develop a simulation model, perform full-scale verification of crash tests, design a Programmer's manual, and publish report on findings.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Report and Users Manual, IS INTENDED TO SUPPORT Crashworthiness Criteria for G/A airplane structure AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 2/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Increase size of simulation model | 1/79 |
| 2. Analyze section of twin engine airplane structure | 1/79 |
| 3. Publish reports | 2/79 |

14. FOOTNOTES:

IV 184-521-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 184-521-02

3. REVISION:

4. START DATE: 7/72

5. TITLE OF PROJECT:
Seat/Restraint Analysis and Design Criteria

6. MANAGER/ORGANIZATION:
Herbert C. Spicer ARD-520

7. REQUIREMENT: 9550 #AFS-500-77-01
FAA-ED-18-1A

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: Dynamic Sciences
FA72WA-3101

b. TSC:

Penn. State FA77AC-7228 CAMI

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide data to improve the crash-worthiness of general aviation airplane seat and restraint systems.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract and CAMI support, will complete simulation improvement, perform static validation tests, dynamic tests and provide basis for standard criteria.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Tech Reports and Users Manual, IS INTENDED TO SUPPORT Standards for Improved Seats/Restraints AND WILL BE DELIVERABLE TO AFS ON OR ABOUT 9/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Testing of simple and production seats | 9/79 |
| 2. Report - Criteria | 9/79 |

14. FOOTNOTES:

IV 184-521-02

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SRDS TECHNICAL PROGRAM DOCUMENT. FISCAL YEAR 1979. RESEARCH AND--ETC(U)
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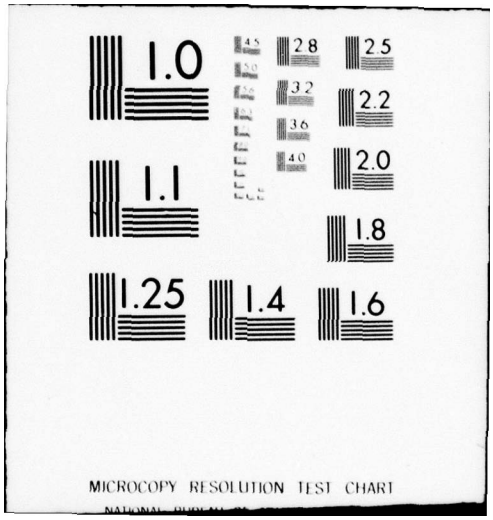
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MICROCOPY RESOLUTION TEST CHART

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 184-521-03

3. REVISION:

4. START DATE: 5/72

5. TITLE OF PROJECT:
General Aviation Crash Resistant Fuel System

6. MANAGER/ORGANIZATION:
Herbert Spicer ARD-520

7. REQUIREMENT:
FAA-ED-18-1[A]

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-400

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide technical data from which criteria for standards can be extracted.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will fabricate fuel tanks and lightweight tanks, perform tests, evaluate results and publish a report on findings.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Report, IS INTENDED TO SUPPORT Standards for G/A fuel systems AND WILL BE DELIVERABLE TO AFS

ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Report (4 tests) | 12/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 184-530-06

3. REVISION:

4. START DATE: 8/1/78

5. TITLE OF PROJECT:
Civil Pilot Judgment Training and Evaluation Syllabus

6. MANAGER/ORGANIZATION:
Patrick E. Russell ARD-530

7. REQUIREMENT:
9550 #AFS-800-75-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide Flight Standards Service with a method for training civil student and instructor pilots to use good judgment in all aspects of their ground and flight activities.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will develop a ground and flight training syllabus which will address the subject of pilot judgment in a formal, structured, documented manner.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Judgment Syllabus, IS INTENDED TO SUPPORT Certification of civil pilots AND WILL BE DELIVERABLE TO AFS

ON OR ABOUT 4/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Sign contract | 6/79 |
| 2. Receive Final Report | 4/80 |

14. FOOTNOTES: This is Phase II of a three-phase project.

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 185-561-01

3. REVISION:

4. START DATE: 7/1/75

5. TITLE OF PROJECT: Aviation Security and Research Program

6. MANAGER/ORGANIZATION: Gerald Carp ARD-560

7. REQUIREMENT: Aviation Security Engineering and Development Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-410 NPD 18-481
   b. TSC: TSC-641 PPA-FA745
   c. OTHER: Westinghouse FA75WA-3741
   SWR Inst. FA76WA-3784
   MITRE

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide devices and ancillary equipment to detect and prevent weapons and explosives being introduced into the aircraft/airport environment.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC, TSC, and contract support, will expedite and expand those efforts already underway in this area; and through studies and tests, identify promising systems and initiate new R&D projects to develop them.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Explosive Detection System., IS INTENDED TO SUPPORT Aviation Security Program AND WILL BE DELIVERABLE TO ACS

ON OR ABOUT 9/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Advanced technical studies completed | 9/80 |
| 2. Detection of Bombs and air cargo | 1/80 |
| 3. Enhanced x-ray explosive system | 8/80 |

14. FOOTNOTES:

20 ENVIRONMENT

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 201-521-01

3. REVISION:

4. START DATE: 9/75

5. TITLE OF PROJECT:
Development of Criteria for Monitoring of Airport Ground Pollution

6. MANAGER/ORGANIZATION:
Lawrence Taubenkibel ARD-550

7. REQUIREMENT: 9550 #AFS-100-75-148
Tech Prog. Plan FAA-ED-20-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine criteria to validate monitoring techniques or systems for assessment of airport ground pollution.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will examine techniques to determine those techniques most feasible and practical; and define a set of criteria to be used as a standard for assessing proper procedures for determining acceptability. Certification Handbook will be prepared, based on findings.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT Agency policy on Environmental Impact Statements AND WILL BE DELIVERABLE TO AEQ/AFS ON OR ABOUT 2/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Certification Handbook data | 11/78 |
| 2. Report to AEQ | 2/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 201-521-02

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT:
Turbine Engine Particulate Characterization

6. MANAGER/ORGANIZATION:
John E. Tigue ARD-550

7. REQUIREMENT:
FAA-ED-20-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-410 NPD 20-446

b. TSC:

c. OTHER: IIT Research Institute
FA75WA-3722

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Characterize the particulate emissions of turbine aircraft engines to access their impact on the environment in an airport environment.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will develop a system for sampling particulates. Data will be collected, analyzed and evaluated. A report will be published on findings.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Report, IS INTENDED TO SUPPORT FAA Standards for Particulate Emissions of turbine engines AND WILL BE DELIVERABLE TO AEQ ON OR ABOUT 9/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Engine sampling analysis | 12/78 |
| 2. Evaluation of results | 4/79 |
| 3. Final report to AEQ | 9/79 |

14. FOOTNOTES:

IV 201-521-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 201-521-04

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT:
Development of time-degradation factors for turbine-engine emissions

6. MANAGER/ORGANIZATION:
C. Ritter ARD-550

7. REQUIREMENT:
FAA-ED-20-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-410 NPD 20-446

c. OTHER: Northern Research & Engineering Corp. FA74NA-1100

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: establish the factors that describe by what amount turbine engine-exhaust emissions change with operating time.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contracting support, will periodically sample emissions from a statistically representative number of in-service engines of all classes and evaluate data. A report will be published on findings.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT FAA regulations on Turbine Engine Emissions AND WILL BE DELIVERABLE TO AEQ ON OR ABOUT 10/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Recommendations to AEQ | 10/78 |

14. FOOTNOTES:

IV 201-521-04

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 201-521-09

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT:
Turbine Engine Emission Measurement System Development

6. MANAGER/ORGANIZATION:
L. Taubenkibel ARD-550

7. REQUIREMENT:
ED-20-1-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support the regulatory responsibilities of the FAA in implementing and enforcing aircraft exhaust emission standards as issued by the EPA. The objective is to develop a standardized measurement system.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: The system will be developed through in-house efforts at NAFEC and through contractual efforts with industry. The goal is to define a system that considers all variables associated with the system from the engine exhaust output to the digitized assessment of the pollutant level.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, standard measurement system, IS INTENDED TO SUPPORT FAA's responsibility for implementing AND WILL BE DELIVERABLE TO AEQ and AFS and enforcing EPA emission standards ON OR ABOUT I/82.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. CF6 sampling verification | 12/78 |
| 2. JT8D sampling verification | 8/79 |
| 3. RB211 sampling verification | 9/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 201-521-10

3. REVISION:

4. START DATE: 2/78

5. TITLE OF PROJECT: Turbine Engine Emission Variability

6. MANAGER/ORGANIZATION: Robert S. Zuckerman ARD-550

7. REQUIREMENT: FAA ED-20-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-410
   NPD 20-446
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Provide a data base and support the development of FAA emissions regulation, in response to EPA standards for aircraft exhaust emissions.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Emissions measurement will be made on aircraft propulsion turboengines manufactured by Pratt and Whitney Aircraft, General Electric and Rolls Royce in order to establish expected emissions levels at manufacture, after overhaul and between (or before) overhauls. The resultant data base will characterize emission levels.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT Emission Regulation AND WILL BE DELIVERABLE TO AEE/AFS

ON OR ABOUT 9/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Data Collection Complete | 7/79 |
| 2. Report to AEE/AFS | 9/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 11/17/78

2. CURRENT NUMBER: IV 201-521-12

3. REVISION:

4. START DATE: 9/78

5. TITLE OF PROJECT:

CRC Aircraft Engine Emission Data Correlation Investigation

6. MANAGER/ORGANIZATION: L. Taubenkibel ARD-550

7. REQUIREMENT: FAA ED-20-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC: NPD-20-446
ANA-410

b. TSC:

c. OTHER: Coordinating Research Council

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: cross-correlate data output of sampling equipment in use industry and government to permit understanding of emissions measurements. This will enable the establishment of mutual confidence within government and industry in the validity and correlation of the various engine emissions data.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Initiate and organize a cooperative effort among industry and government to cross-correlate data output from exhaust emission measurement equipment in use by the various segments. The FAA turbine engine test facility at NAFEC will provide the operating personnel, engines and fuel. CRC will provide scheduling and management of data collection and analysis.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT AEE preparation of emission regulation AND WILL BE DELIVERABLE TO AEE

ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Coordinating Research Council (CRC) contract award | 7/78 |
| 2. Initiate NAFEC tests | 9/78 |
| 3. " field tests | 2/79 |
| 4. Data Analysis Complete | 9/79 |
| 5. Report to AEE | 12/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 202-551-1

3. REVISION:

4. START DATE: 6/71

5. TITLE OF PROJECT:
Noise Retrofit Feasibility

6. MANAGER/ORGANIZATION:
Harold True ARD-550

7. REQUIREMENT: FAA ED-20-2.1
FAA Environmental Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER: P and WA
FA76WA-3809

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop economically reasonable retrofit programs to minimize current aircraft noise; and provide technically feasible, economically reasonable retrofit solutions to minimize noise of JT3D and JT8D powered commercial fleet and business jets.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS will perform Cost/Benefit analysis, ground and flight tests and evaluate results. The use of nacelle treatment jet noise suppression and re-engine alternatives will be considered.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Information Brief, IS INTENDED TO SUPPORT 1980 Reduction of FAR Part 36 Noise Levels AND WILL BE DELIVERABLE TO AEQ ON OR ABOUT 12/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. JT8D Mixer Draft Report Available | 12/80 |
| 2. SRDS Information brief available | 12/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 202-551-02

3. REVISION:

4. START DATE: 1971

5. TITLE OF PROJECT:
Core Engine Noise Evaluation and Control

6. MANAGER/ORGANIZATION:
Robert S. Zuckerman ARD-550

7. REQUIREMENT: FAA ED-20-2.1 (FL 90-411)
FAA Environment Plan (A76-1980)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER: General Electric - DOT FA75WA-3688
P&WA DOT FA75WA-3663

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop an aircraft noise source data base for regulation related to core noise of modern, high bypass turbofan engines, including those intended to meet stringent emissions standards.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Through contractor support, SRDS will develop noise prediction and reduction models for core engine components (combustor turbine, nozzle) and component interaction effects.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, ARD Information Brief, IS INTENDED TO SUPPORT 1980 Reduction of FAR Part 36 Noise Levels AND WILL BE DELIVERABLE TO AEE-1 ON OR ABOUT Oct 1980.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Indirect Combustion Noise Effects Report | 12/78 |
| 2. ARD Information Brief Available | 10/80 |

14. FOOTNOTES:

IV 202-551-02

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 202-551-05

3. REVISION:

4. START DATE: 7/75

5. TITLE OF PROJECT:
Jet Noise Source Location and Reduction

6. MANAGER/ORGANIZATION:
Robert S. Zuckerman ARD-550

7. REQUIREMENT:
FAA-ED-20-2.1 (PL 90-411)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: To develop an aircraft noise source data base and investigate suppression mechanisms for regulation related to high velocity jet noise.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: A fundamental research effort supported by an extensive experimental investigation of single flow and coannular flow jet noise nozzles and suitable suppression.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, ARD Information Brief, IS INTENDED TO SUPPORT 1980 Reduction in FAA Part 36 Aircraft Noise Level Requirements AND WILL BE DELIVERABLE TO AEE-1 ON OR ABOUT ~~10/80~~.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Preparation of Jet Noise Suppressor Design Guide | 10/78 |
| 2. Addendum: Mixed Flow & Shock Cell Model | 10/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 202-551-06

3. REVISION:

4. START DATE: 10/78

5. TITLE OF PROJECT:
Helicopter Noise Prediction and Reduction

6. MANAGER/ORGANIZATION:
Harold C. True ARD-550

7. REQUIREMENT: Helicopter Program Plan Draft (3/78)

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: (to be determined)
b. TSC:
c. OTHER: UTSI DOT-FA72WA-3053

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support the Helicopter Program Plan objectives of expanding the helicopter noise data base and supporting future regulatory efforts to reduce helicopter noise impact.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Contract and in-house effort will be directed at developing an improved, component based prediction model for parametric studies, analyzing noise abatement operational procedures, investigating interior noise and vibration, and investigating promising noise abatement modifications applicable to current helicopters.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Information Brief, IS INTENDED TO SUPPORT Helicopter Program AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 6/84.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Final Report: Interior Noise | 3/80 |
| 2. Final Report: Noise Abatement Operations | 10/81 |
| 3. Complete Prediction Model verification | 8/82 |
| 4. Final Report: Noise Reduction Demonstration | 9/83 |

14. FOOTNOTES:

IV 202-551-06

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 202-552-01

3. REVISION:

4. START DATE: 6/74

5. TITLE OF PROJECT:
Operational Noise Reduction

6. MANAGER/ORGANIZATION:
Harold C. True ARD-550

7. REQUIREMENT: FAA ED-20.2.1 (PL 90.411)
FAA Environment Plan (1976-1980)
9550 No. AEQ-220-76-1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: NPD 08-459
b. TSC:
c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: To provide a research data base to support operational noise reduction and noise certification techniques.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Perform studies and field measurements of aircraft noise to develop improved noise propagation information including the effects of temperature, humidity, wind and turbulence. Correlate noise contour area with operational and certification procedures and meteorological conditions.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, ARD Information Brief, IS INTENDED TO SUPPORT Reduction of Part 36 Noise Levels (FAA Environmental Plan 1976-1980) AND WILL BE DELIVERABLE TO AEE-1 ON OR ABOUT 9/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Meteorological Effects on Noise Measurement Test Report | 8/79 |
| 2. STOL Certification Procedures Report | 6/80 |
| 3. Meteorological Effects on Noise Measurement | 9/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: IV 202-553-01

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT:
Noise Evaluation and Response

6. MANAGER/ORGANIZATION:
Thomas H. Higgins ARD-550

7. REQUIREMENT:
FAA ED-20-2.1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: Obtain certification and design criteria for aircraft and airports. Determination of significant variables that influence response to noise, development of psychoacoustic measures procedures and guidelines for control of noise exposure as required by Public Law and Environment Assessments.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Conduct Psychoacoustic Tests regarding the effects of noise on man and the development of acceptable procedures and yard-sticks for evaluating aircraft noise and community noise exposure.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Final Report, IS INTENDED TO SUPPORT Regulatory action provide certification AND WILL BE DELIVERABLE TO AEE, AAS, AMA and design criteria for aircraft and airports ON OR ABOUT 10/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Aircraft Interior Noise/Safety/Design Certification Criteria | 10/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-060-15

3. REVISION:

4. START DATE: 1/78

5. TITLE OF PROJECT: ECAC Analytical Services

6. MANAGER/ORGANIZATION: Charles Cram ARD-62

7. REQUIREMENT: FAA ED 21-4, 2.2.1(1) and (6)a

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: Electromagnetic Compatibility Analysis Center (ECAC) DOT FA77WAI-778

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide quick response, analytical services to Headquarters and Regional Airway Facilities personnel.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Exercise the numerous computer models that exist within ECAC, as required, to generate facility coverage plots, map overlays, etc. to assist AAF in siting new facilities, determining theoretical coverage of existing facilities, etc.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Computer outputs, IS INTENDED TO SUPPORT AAF Headquarters/Regional Engineering Personnel AND WILL BE DELIVERABLE TO AAF ON OR ABOUT 2/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Quarterly review of ECAC outputs | 12/78 |
| 2. Completion of support effort | 1/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-060-21

3. REVISION:

4. START DATE: 4/77

5. TITLE OF PROJECT: Special Propagation (WARC)

6. MANAGER/ORGANIZATION: P.D. Blythe ARD-61

7. REQUIREMENT: FAA-ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: Institute for Telecommunication Sciences
DOT FA-77WAI-742

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support FAA participation in World Administrative Radio Conference (WARC) action.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will provide technical data, on short notice, concerning electromagnetic propagation and spectrum matters. Personnel expertise, existing propagation models, and spectrum computer models will be employed.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Studies/ Reports, IS INTENDED TO SUPPORT FAA participation in WARC AND WILL BE DELIVERABLE TO U.S. WARC Representative ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Review of all completed tasks | 12/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-060-22

3. REVISION:

4. START DATE: Continuing

5. TITLE OF PROJECT: Applications Engineering

6. MANAGER/ORGANIZATION: Robert D. Smith ARD-62

7. REQUIREMENT: FAA-ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: Institute for Telecommunications Sciences DOT FA-78-WAI-940

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide spectrum engineering support for FAA projects, as required, on a continuing basis.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will employ computer models based on theory and measured data; perform comparisons between predicted and measured data, and provide results to requesting Office/Service.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Quick response analyses, IS INTENDED TO SUPPORT FAA Projects AND WILL BE DELIVERABLE TO Requestor ON OR ABOUT as required.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-060-24

3. REVISION:

4. START DATE: 10/76

5. TITLE OF PROJECT:
Ground Conductivity Wave Tilt Measurements

6. MANAGER/ORGANIZATION:
Charles Cram ARD-62

7. REQUIREMENT:
FAA ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: Army Cold Regions Research and Engineering Lab DOT FATQWI-707

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop airborne and ground conductivity measurement methods for use in spectrum engineering site selection and resistivity mapping.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: A conductivity map, based on geological data and limited measurements, is to be generated for frequency assignment purposes.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT Frequency Engineering Actions AND WILL BE DELIVERABLE TO SRDS

ON OR ABOUT 11/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Report | 11/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-060-26

3. REVISION:

4. START DATE: 11/77

5. TITLE OF PROJECT: Applications Engineering (ECAC)

6. MANAGER/ORGANIZATION: Charles Cram ARD-62

7. REQUIREMENT: FAA ED 21-4,2.2.9.1

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: Electromagnetic Compatibility Analysis Center DOT FA77WAI-778

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide spectrum engineering, EMC and utilization analyses for use in spectrum management activities.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Exercise computer models available at ECAC to provide spectrum engineering, EMC and utilization analyses for use in FAA spectrum management activities.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Computer outputs, IS INTENDED TO SUPPORT Spectrum Engineering & Planning AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Final Review and Report | 12/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-060-33

3. REVISION:

4. START DATE: 10/78

5. TITLE OF PROJECT: Alaskan Air/Ground HF Communications Prediction Service

6. MANAGER/ORGANIZATION: P. D. Blythe ARD-61

7. REQUIREMENT: 9550 # AL-ARD-076-003

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: FAA/Navy/Air Force/NOAA cooperative effort

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide ATC with the means to reduce outage times, save operator trial and error time, save power consumption associated with simultaneous use of multiple frequencies, and provide advance warning of OMEGA course deterioration.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: Through Navy support, data line arrangements will be provided FAA for a "real time" prediction service.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Prediction Service, IS INTENDED TO SUPPORT ATC HF/Air Ground Communications and OMEGA Course AND WILL BE DELIVERABLE TO AAL-400

ON OR ABOUT 3/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Data line arrangements | 2/79 |
| 2. Computer software programs | 6/79 |
| 3. Prediction terminal installation | 10/79 |
| 4. Operational testing completed | 3/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-060-39

3. REVISION:

4. START DATE: 9/6/76

5. TITLE OF PROJECT:
Electromagnetic Measurement Techniques for Spectrum Analysis/Engineering

6. MANAGER/ORGANIZATION:
J. D. Fretz ARD-61

7. REQUIREMENT: Support to AAF and Regional Freq. Management Off.

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-303 NPD #21-383

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: revise the current handbook to include improved spectrum measurement procedures made possible by new instrumentation now available.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will sample radiated signals from FAA Communication/Navigation facilities, using combinations of instrumentation systems on the new Spectrum Characteristic Analysis and Measuremen vehicle. Results will be compared. Most effective procedures and resulting data will be presented in the handbook.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Handbook 6050.23, IS INTENDED TO SUPPORT Electromagnetic compatibility measurement activities in Frequency Management AND WILL BE DELIVERABLE TO AAF, ARD, RFMO

ON OR ABOUT 11/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Complete measurements at sample field facilities | 3/79 |
| 2. Complete handbook (draft) for circulation | 6/79 |
| 3. Final handbook printed | 11/79 |

14. FOOTNOTES:

I 213-060-39

FD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-060-49

3. REVISION:

4. START DATE: 10/74

5. TITLE OF PROJECT: World Radio Conference (WARC - 1979) of the International Telecommunications Union (ITU)

6. MANAGER/ORGANIZATION: P. D. Blythe ARD-61

7. REQUIREMENT: FAA-ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: Interdepartmental Radio Advisory Committee (IRAC)

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: formulate, support and defend U.S./FAA radio spectrum requirements to satisfy needs through the year 2000.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, in coordination with IRAC, will identify existing and future specific requirements and provide detailed justifications, including economic impact, in order to defend the aviation need.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, FAA Aviation Position, IS INTENDED TO SUPPORT Aviation spectrum requirements through year 2000 AND WILL BE DELIVERABLE TO IRAC/Dept. of State ON OR ABOUT 10/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Establish U.S. Position | 1/79 |
| 2. Attend ITU WARC-79 | 10/79 |

14. FOOTNOTES: By letter dated 6/13/74, FAA Administrator specified FAA involvement to Director, Office of Telecommunications Policy, Executive Office of the President.



RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-061-01

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT:
Terminal Radar Interference Threshold Criteria

6. MANAGER/ORGANIZATION:
William Reytar ARD-62

7. REQUIREMENT:
FAA-ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

b. TSC:

c. OTHER: Lincoln Labs - not yet awarded

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support FAA position that the satellite power flux density limit must be reduced by at least 15dB to protect radars in the 3.5 - 3.7 GHz band.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will measure the effects of geosynchronous satellite continous wave emissions on the proposed limited surveillance radar in the frequency band 3500 - 3700 MHz.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT Frequency planning in the 3500 - 3700 MHz band AND WILL BE DELIVERABLE TO ARD-200/AAF ON OR ABOUT 2/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Issue draft report | 1/79 |
| 2. Deliver final report | 2/79 |

14. FOOTNOTES:

I 213-061-01

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-061-09

3. REVISION:

4. START DATE:

5. TITLE OF PROJECT:
ASDE EMC Studies

6. MANAGER/ORGANIZATION:
William Reytar ARD-62

7. REQUIREMENT:
FAA-ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
NPD No. 21-383

c. OTHER: Task 4 - FA77WAI-778
IAA with ECAC, Annapolis, Md.

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine electromagnetic compatibility problems created by introducing Airport surface detection equipment in the 15.7 - 17.7 GHz band.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with ECAC support, will identify ASDE EMC requirements, design goals, determine constraints germane to ASDE development, and determine nature and extent of interference caused to military radars by the new ASDE.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Reports, IS INTENDED TO SUPPORT ASDE Spectrum Mgmt Program AND WILL BE DELIVERABLE TO SRDS

ON OR ABOUT 12/78.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Final report on ASDE interference to military radars | 11/78 |
| 2. Final report on NAFEC test flight plans | 12/78 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-061-10

3. REVISION:

4. START DATE: 1/25/74

5. TITLE OF PROJECT:
ATCRBS Spectrum Management Criteria

6. MANAGER/ORGANIZATION:
William Reytar

7. REQUIREMENT:
FAA-ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: IAA DOT-FA70WAI-175
ECAC , Annapolis, Md.

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop, update and augment analysis and exercise models to improve ATCRBS spectrum management criteria.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with ECAC support, will develop transient effects Performance Prediction Model (PPM) and equipment models; evaluate impact of changes in spectrum management techniques, and augment PPMs with antenna pattern and predict performance with different antennas and effects of obstacles and ground plane reflections.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Technical Reports, IS INTENDED TO SUPPORT Spectrum Management Program AND WILL BE DELIVERABLE TO AAF/SRDS/FAA Offices

ON OR ABOUT 1/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Final Report/ATCRBS Amt Pattern on ATCRBS Performance | 1/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-061-16

3. REVISION:

4. START DATE: 7/28/72

5. TITLE OF PROJECT: DABS Electromagnetic Compatibility

6. MANAGER/ORGANIZATION: William Reytar ARD-62

7. REQUIREMENT: FAA ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: IAA DOT FA77WAI-778 with ECAC, Annapolis, Md.

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide FAA and DABS Engineering/ Design Contractors with Electromagnetic Compatibility analysis.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with ECAC support, will update detailed interrogator file within 200 nautical miles of NAFEC for FAA Systems Engineering Contractor. Document DABS/AIMS/ATCRBS Performance Prediction Model.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Interrogator File and Report, IS INTENDED TO SUPPORT DABS development, implementation and operation. AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 1/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Final Report - DABS/AIMS/ATCRBS Performance Prediction Model | 12/78 |
| 2. Draft Report - Mutual Compatibility of DABS/ATCRBS | 12/78 |
| 3. Mutual Compatibility of DABS/ATCRBS Final Report | 1/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-062-07

3. REVISION:

4. START DATE: 5/29/75

5. TITLE OF PROJECT: EMC Analysis BCAS

6. MANAGER/ORGANIZATION: William Reytar ARD-62

7. REQUIREMENT: FAA-ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: IAA DOT FA70WAI-175 with ECAC, Annapolis, Md.

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: determine how well the beacon derived collision avoidance system will perform in an AIMS/ATCRBS environment, and predict any BCAS interference to ATCRBS/DABS/AIMS.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with ECAC support and using augmented performance prediction model, will predict the impact of enchanced active BCAS on the performance of ATCRBS at Washington, D. C., and on ATCRBS and DABS in Los Angeles basin area.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports, IS INTENDED TO SUPPORT BCAS Development Program AND WILL BE DELIVERABLE TO SRDS

ON OR ABOUT 2/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Draft Report - Tri-Model BCAS analysis, Los Angeles area | 12/78 |
| 2. Final Report - Tri-Model BCAS, Los Angeles | 2/79 |

14. FOOTNOTES:

I 213-062-07

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-062-10

3. REVISION:

4. START DATE: 2/74

5. TITLE OF PROJECT: Objective Voice Grade by Time Domain Technique

6. MANAGER/ORGANIZATION: J. D. Fretz - ARD-61

7. REQUIREMENT: FAA ED 21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
b. TSC:
c. OTHER: DOT-FA74WAI-448 Institute for Telecommunication Science

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a voice grade standard measurement technique for communications channels to assist in spectrum and communications systems engineering activities.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will examine linear prediction coding techniques as well as more conventional techniques of measuring channel performance, i.e. computer analysis of waveforms, noise meters intermodulation and harmonic measurements and differential audio spectrograms.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Reports and Computer Program, IS INTENDED TO SUPPORT Spectrum and Communications AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 10/79 Engineering activities.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Amendment Phase V - Articulation Scoring (Refine) | 10/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-062-35

3. REVISION:

4. START DATE: 12/75

5. TITLE OF PROJECT:
Update of the Navigation Separation Handbook

6. MANAGER/ORGANIZATION:
Robert D. Smith ARD-62

7. REQUIREMENT:
FAA-ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
NPD No. 21-383

b. TSC:

c. OTHER: FINFO Interagency Agreement

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: revise handbook to accommodate changes in ground systems, particularly antennas and transmitter powers.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will coordinate proposed changes with all Regional Directors, ATF and AFS. Flight tests will be conducted and resulting data will be analyzed.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Draft Handbook 6050.5B, IS INTENDED TO SUPPORT Navigation Frequency/Distance Separation Criteria AND WILL BE DELIVERABLE TO AAF ON OR ABOUT 6/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Data Report - VOR and ILS Signal Strenths and D/U Ratios | 1/79 |
| 2. CATV NAV/COM EMC final report | 3/79 |
| 3. Final Draft 6050.5B Complete | 6/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-062-36

3. REVISION:

4. START DATE: 4/76

5. TITLE OF PROJECT:

VHF/UHF Air/Ground Communications Frequency Engineering Handbook 6050.4B

6. MANAGER/ORGANIZATION:

Charles Cram ARD-62

7. REQUIREMENT:

FAA-ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC:

b. TSC:

c. OTHER: Institute for Telecommunications Sciences DOT-FA74WAI-448 ECAC IAA DOT-FA70WAI-175

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: update the existing handbook which establishes assignment of frequencies to VHF/UHF air/ground communications facilities.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will develop propagation curves for desired/undesired ratios. Co-site studies will be conducted. Analyses of collected data will be performed to provide basis for updating handbook.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Engineering Handbook, IS INTENDED TO SUPPORT Headquarters/Regional Frequency Management Offices AND WILL BE DELIVERABLE TO SRDS ON OR ABOUT 4/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Cosite interference guidelines | 12/78 |
| 2. Second Draft of Handbook | 2/79 |
| 3. Final Handbook | 4/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-062-37

3. REVISION:

4. START DATE: 11/10/76

5. TITLE OF PROJECT:
VHF/UHF Microwave Link Frequency Engineering Handbook, 6050.17A, Revision

6. MANAGER/ORGANIZATION:
J. D. Fretz ARD-61

7. REQUIREMENT:
FAA-ED-21-4

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-300 NPD No. 21-383

b. TSC:

c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: revise handbook 6050.17A to incorporate criteria for new equipment, new frequencies, band sharing with high power satellite systems, and provide improved electromagnetic compatibility analysis aids.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS with NAFEC support, will develop a frequency plan for band sharing, perform EMC measurements on the new Microwave Link equipment, and incorporate findings into the handbook.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Revised Handbook 6050.17, IS INTENDED TO SUPPORT Frequency engineering and assignment activities AND WILL BE DELIVERABLE TO SRDS/AAF ON OR ABOUT 7/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Frequency Plan for Band Sharing | 12/78 |
| 2. Draft Handbook complete | 2/79 |
| 3. Final Handbook complete | 7/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 213-062-39

3. REVISION:

4. START DATE: 10/78

5. TITLE OF PROJECT:

Power Line Carrier Interference Investigation

6. MANAGER/ORGANIZATION:

Charles Cram ARD-62

7. REQUIREMENT:

9550 No. AFS-100-78-161

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:

a. NAFEC:

b. TSC:

c. OTHER: Institute for Telecommunication ScienceDOT-FA74WAI-448

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a method of predicting and measuring interference from power line carriers.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will investigate a VLF Antenna Calibration System, perform ADF receiver susceptibility tests, and conduct flight tests over PLC facilities of the Tennessee Valley Authority.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Report, IS INTENDED TO SUPPORT AFS Measurement of Power Line Carrier Interference AND WILL BE DELIVERABLE TO SRDS/AFS ON OR ABOUT 10/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Antenna calibration System Complete | 5/79 |
| 2. Interference Prediction Models | 8/78 |
| 3. Final Report | 10/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 216-102-02

3. REVISION:

4. START DATE: 6/75

5. TITLE OF PROJECT:
FAA Academy Radar Training Facility

6. MANAGER/ORGANIZATION:
G. Kassing ARD-151

7. REQUIREMENT:
FAA-ED-21-5

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER: Logicon, Inc.
DOT-FA78WA-4101

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: support agency effort to acquire realistic radar training of facility for the Academy.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will develop functional specifications for procurement of the simulator, evaluate system proposals, monitor contractor's development, test and installation of simulator at Academy, and provide total overall program management.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, A radar training facility, IS INTENDED TO SUPPORT FAA program to upgrade the evaluation AND WILL BE DELIVERABLE TO Aeronautical Center of Air Traffic Control Specialist ON OR ABOUT 1/80 and 8/80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Start installation and checkout (1 system) at AAC | 4/79 |
| 2. Baseline System complete | 1/80 |
| 3. Phase II Enhancements Complete | 8/80 |

14. FOOTNOTES:

I 213-102-02

RD FORM 79-1 TEST 9/15/78

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 216-105-01

3. REVISION:

4. START DATE: 10/76

5. TITLE OF PROJECT:
Productivity in ATC Automation

6. MANAGER/ORGANIZATION:
Bill Petruzel ARD-152

7. REQUIREMENT:
OST UG3RD Review 1974

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:

c. OTHER:

b. TSC: PPA No. FA-937
DTS-534

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: develop a fast time simulation model to serve as a tool in assessing air traffic controller productivity.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with TSC, will develop and validate a simulation model for use in studying the potential productivity effects of resectorization and traffic routing at Chicago, ARTCC.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Resectorization Study, IS INTENDED TO SUPPORT Improvement of Techniques AND WILL BE DELIVERABLE TO SRDS for estimating ATCS Productivity ON OR ABOUT 4/79 and 12/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1.Data reduction complete | 1/79 |
| 2.Model Validation Report | 4/79 |
| 3.Simulation testing complete | 8/79 |
| 4.Final Report | 12/79 |

14. FOOTNOTES:

I 216-105-01

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# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 218-150-02

3. REVISION:

4. START DATE: 10/77

5. TITLE OF PROJECT: FAA/NASA VTOL Support Program

6. MANAGER/ORGANIZATION: Joseph O'Brien ARD-150

7. REQUIREMENT: FAA/NASA Cooperative Program

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
   a. NAFEC: ANA-110 NPD No. SE-191
   b. TSC:
   c. OTHER:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide operational support for NASA short haul helicopter operations.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will develop designs for VTOL operations in various environments, such as city center to city center, airport to city center, etc.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Concepts and Procedures, IS INTENDED TO SUPPORT more progressive ATC handling of helicopters AND WILL BE DELIVERABLE TO AAT and AFS ON OR ABOUT 8/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Develop offshore concepts | 12/78 |
| 2. Develop city center concepts | 8/79 |

14. FOOTNOTES:

I 216-150-02

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 218-150-03

3. REVISION:

4. START DATE: 5/12/78

5. TITLE OF PROJECT:
FAA/NASA Cockpit Display of Traffic Information (CDTI)

6. MANAGER/ORGANIZATION:
Joseph O'Brien ARD-150

7. REQUIREMENT:
CDTI Program Plan

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-110 NPD #SE-191

b. TSC:

c. OTHER: NASA Ames and Langley Research Centers

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: investigate proposals for distributed management concepts between ground systems and airborne participants.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC support, will formulate, simulate and evaluate concepts against a 1985 type ATC scenario in assurance/confidence pilot monitoring modes, and pilot cooperative modes.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, concepts and procedures, IS INTENDED TO SUPPORT investigation of distributed management concept AND WILL BE DELIVERABLE TO AAT/AFS ON OR ABOUT FY-81.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Develop Initial Concepts for Monitoring Mode | 3/79 |
| 2. Develop Initial Concepts for Cooperative Mode | 4/79 |
| 3. Develop Controller Monitoring Mode Concepts | 11/79 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 218-153-01

3. REVISION:

4. START DATE: 10/72

5. TITLE OF PROJECT:
Digital Simulation Facility - Software Support Contract

6. MANAGER/ORGANIZATION:
M. E. Perie ARD-100

7. REQUIREMENT: Simulation Review Board recommendation 1972

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-242 NPD No. 21-253

c. OTHER: DOT-FA77NA-4011
Computer Sciences

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: upgrade the Digital Simulation Facility and the simulation projects at NAFEC.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with contract support, will provide the necessary program modifications and facility enhancements for SRDS simulation projects.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Software support, IS INTENDED TO SUPPORT upgrading of NAFEC DSF, and simulation projects AND WILL BE DELIVERABLE TO NAFEC ON OR ABOUT continous.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| Continous software support thru | 3/80 |

14. FOOTNOTES:

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 219-151-01

3. REVISION:

4. START DATE: 10/76

5. TITLE OF PROJECT:
Terminal Interfaces (LLWSAS, VAS, TIPS, ASTC, RMMS) *

6. MANAGER/ORGANIZATION:
R. Primeau ARD-151

7. REQUIREMENT: IAA dated 3/16/78
AAF/ARD/ANA

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC: ANA-230 NPD No. 21-290
ANA-330 NPD No. 21-399 ANA-110 NPD No. SE-191

c. OTHER:

b. TSC:

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide alternative approaches to resolving integration issues associated with advanced systems and subsystems being developed; and provide guidance to longer-range planning for future subsystem integration.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and TSC support will perform analyses of integration issues, and evaluation of alternate solutions; define requirements for advanced facility design, and document results in specifications and/or handbooks.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, reports, specifications, IS INTENDED TO SUPPORT system development programs, ATC facility enhancements and operations AND WILL BE DELIVERABLE TO ARD, AAT, AAF ON OR ABOUT FY-80.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. Report on TRACON and Cab Display/ Remote Maintenance System | 12/78 |
| 2. Technical Data Package for lighting/RVR | 12/78 |
| 3. Update Advanced Terminal Facility Design Handbook | 12/79 |

14. FOOTNOTES: *LLWSAS - Low Level Wind Shear Advisory System; VAS - Vortex Advisory System; TIPS - Terminal Information Processing System; ASTC - Airport Surface Traffic Control; RMMS - Remote Maintenance Monitoring System

# Research and Technology Resume

1. DATE OF RESUME: 10/1/78

2. CURRENT NUMBER: I 219-152-01

3. REVISION:

4. START DATE: 8/4/78

5. TITLE OF PROJECT:
Evaluation of Color Display

6. MANAGER/ORGANIZATION:
J. O.'Brien ARD-150

7. REQUIREMENT:
9550 No. AAF-610-78-006

9. PARTICIPATING ORGANIZATIONS AND AGREEMENT NUMBERS:
a. NAFEC:
ANA-170 NPD No. SE-190

b. TSC:

c. OTHER:
MITRE Corp.

10. OBJECTIVE(S):

THE LEVEL OF EFFORT IDENTIFIED IN THIS RESUME IS INTENDED TO: provide technical guidance for the purchase of Planned View Displays to be implemented at Air Traffic Control facilities.

11. APPROACH:

THIS EFFORT WILL BE ACCOMPLISHED IN THE FOLLOWING MANNER: SRDS, with NAFEC and contract support, will test, evaluate and modify Planned View Displays/Display Control Vector Generators to determine required performance parameters.

12. PRODUCT:

THE PRODUCT OF THIS RESUME, Techical Report, IS INTENDED TO SUPPORT planning/procurement of color PVDs for ATC field implementation AND WILL BE DELIVERABLE TO AAF/AAT/ARD ON OR ABOUT 10/79.

13. MILESTONE SCHEDULE:

| DESCRIPTION | DATE |
|---|---|
| 1. PVD/DCVG Modes Completed | 2/79 |
| 2. Operational Evaluation | 8/79 |
| 3. Final Report | 10/79 |

14. FOOTNOTES:



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